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THE RELATIONSHIP OF NEW EDUCATIONAL MEDIA TO NON-INTELLECTIVE FACTORS IN LEARNING. LITERATURE REVIEW OF RESEARCH INVOLVING NON-INTELLECTIVE FACTORS IN LEARNING, PHASE 1.

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A REVIEW OF THE LITERATURE ON THE ROLE OF NONINTELLECTIVE FACTORS IN LEARNING WAS CONDUCTED TO IDENTIFY AREAS OF NEEDED RESEARCH. STUDIES WERE REVIEWED WHICH WERE CONSIDERED ILLUSTRATIVE OF PREVIOUS ATTEMPTS TO ASSESS NONINTELLECTIVE FACTORS IN A VARIETY OF LEARNING SITUATIONS. BASIC TO THE SYNTHESIS OF RESEARCH FINDINGS FROM THE REVIEW WAS A TAXONOMY FOR CLASSIFYING EXISTING STUDIES. A TAXONOMY WAS FINALLY ADOPTED BASED UPON THESE THREE DIMENSIONS - CRITERION, SAMPLE, AND NONINTELLECTIVE FACTOR INVESTIGATED. THIS REPORT INCLUDED THE LITERATURE REVIEW, ORGANIZED ACCORDING TO THE ADOPTED TAXONOMY, COMMENTS ON THE RESEARCH STUDIES, AND A GENERAL SUMMARY AND IMPLICATIONS FOR FURTHER RESEARCH. MAJOR IMPLICATIONS FOUND IN THE LITERATURE REVIEWED WERE THAT FUTURE STUDIES OF NEW EDUCATIONAL MEDIA SHOULD INCLUDE SUCH CONSIDERATIONS AS CRITERION SPECIFICITY, INTERACTION OF NONINTELLECTIVE FACTORS WITH ABILITY LEVELS AND SEX, REPETITION OF MEASURES DURING LEARNING, AND CRITERION RELIABILITY. (JC)

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# LITERATURE REVIEW OF RESEARCH INVOLVING NON-INTELLECTIVE FACTORS IN LEARNING

## The Relationship of New Educational Media to Non-Intellective Factors in Learning - Phase I

Charles O. Neidt
COLORADO STATE UNIVERSITY

Final Report
Title VII Project Number [redacted] 1000
National Defense Act of 1958
Contract Number [redacted]
3-20-004

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supported by a grant from the
U.S. Department of Health, Education, and Welfare
Office of Education

# LITERATURE REVIEW OF RESEARCH INVOLVING NON-INTELLECTIVE FACTORS IN LEARNING

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## The Relationship of New Educational Media to Non-Intellective Factors in Learning - Phase I

Charles O. Neidt

COLORADO STATE UNIVERSITY

Final Report
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A special note of thanks is extended to the secretaries who typed the several drafts which preceded this manuscript; Mrs. Roberta Grinsell and Mrs. Jean Purslow. Miss Karen Sihler is to be especially commended for her work on the final manuscript. In addition, the secretarial staff of the Colorado State University Research Foundation should be recognized for reproducing the final copy.

## Table of Contents

Section Page

Introduction . . . . . . . . . . . . . . . . . . . . . . . . . 1

I. Criterion Group One: General Grade Point Average . . . 4

A. College and University Students . . . . . . . . . . . 5
  1. Measures of Adjustment, Anxiety, and Motivation 5
  2. Measures of Attitude . . . . . . . . . . . . . . . 90
  3. Assessments of Personal History and Biographical Factors . . . . . . . . . . . . . . . . . . 98
  4. Measures of Interests and Values . . . . . . . . 125
  5. Indices of Study Skills and Practices . . . . . 138
  6. Environmental Factors . . . . . . . . . . . . . 158
  Review . . . . . . . . . . . . . . . . . . . . . . . 174

B. Professional School Students . . . . . . . . . . . . 175
  1. Measures of Adjustment, Anxiety, and Motivation 175
  4. Measures of Interests and Values . . . . . . . . 182

C. Junior High and High School Students . . . . . . . . 185
  1. Measures of Adjustment, Anxiety, and Motivation 185
  3. Assessments of Personal History and Biographical Factors . . . . . . . . . . . . . . . . . . 199
  4. Measures of Interests and Values . . . . . . . . 202
  5. Indices of Study Skills and Practices . . . . . 208
  6. Environmental Factors . . . . . . . . . . . . . 209

D. Elementary School Pupils . . . . . . . . . . . . . . 212
  1. Measures of Adjustment, Anxiety, and Motivation 212
  3. Assessments of Personal History and Biographical Factors . . . . . . . . . . . . . . . . . . 218
  5. Indices of Study Skills and Practices . . . . . 219
  6. Environmental Factors . . . . . . . . . . . . . 221

E. Military Personnel and Adult Groups . . . . . . . . . 223
  1. Measures of Adjustment, Anxiety, and Motivation 223

Criterion Group One Summary . . . . . . . . . . . . . . 226

II. Criterion Group Two: Specific Course Outcomes . . . . . 229

A. College and University Students . . . . . . . . . . . 230
  1. Measures of Adjustment, Anxiety, and Motivation 230
  2. Measures of Attitude . . . . . . . . . . . . . . . 242
  3. Assessments of Personal History and Biographical Factors . . . . . . . . . . . . . . . . . . 249
  4. Measures of Interests and Values . . . . . . . . 250
  5. Indices of Study Skills and Practices . . . . . 252
  6. Environmental Factors . . . . . . . . . . . . . 255

Page

B. Professional School Students . . . . . . . . . . . . . . . 270
  1. Measures of Adjustment, Anxiety, and Motivation . . 270

C. Junior High and High School Students . . . . . . . . . . . 271
  1. Measures of Adjustment, Anxiety, and Motivation . . 271
  4. Measures of Interests and Values . . . . . . . . . . 275
  5. Indices of Study Skills and Practices . . . . . . . 277
  6. Environmental Factors . . . . . . . . . . . . . . . 278

D. Elementary School Pupils . . . . . . . . . . . . . . . . . 279
  1. Measures of Adjustment, Anxiety, and Motivation . . 279
  6. Environmental Factors . . . . . . . . . . . . . . . 280

E. Military Personnel and Adult Groups . . . . . . . . . . 282
  1. Measures of Adjustment, Anxiety, and Motivation . . 282
  3. Assessments of Personal History and Biographical Factors . . . . . . . . . . . . . . . . . . . . 284

Criterion Group Two Summary . . . . . . . . . . . . . . . . 285

III. Criterion Group Three: Performance on Tests Related to Experimental Conditions . . . . . . . . . . . . . . . . . 288

A. College and University Students . . . . . . . . . . . . 289
  1. Measures of Adjustment, Anxiety, and Motivation . . 289
  2. Measures of Attitudes . . . . . . . . . . . . . . . 315
  6. Environmental Factors . . . . . . . . . . . . . . . 321

C. Junior High and High School Students . . . . . . . . . . 347
  1. Measures of Adjustment, Anxiety, and Motivation . . 347
  2. Measures of Attitudes . . . . . . . . . . . . . . . 351
  6. Environmental Factors . . . . . . . . . . . . . . . 352

D. Elementary School Pupils . . . . . . . . . . . . . . . . . 355
  1. Measures of Adjustment, Anxiety, and Motivation . . 355
  3. Assessments of Personal History and Biographical Factors . . . . . . . . . . . . . . . . . . . . 361
  4. Measures of Interests and Values . . . . . . . . . . 363
  6. Environmental Factors . . . . . . . . . . . . . . . 364

E. Military Personnel and Adult Groups . . . . . . . . . . 369
  1. Measures of Adjustment, Anxiety, and Motivation . . 369
  2. Measures of Attitudes . . . . . . . . . . . . . . . 377
  3. Assessments of Personal History and Biographical Factors . . . . . . . . . . . . . . . . . . . . 378
  6. Environmental Factors . . . . . . . . . . . . . . . 380

Criterion Group Three Summary . . . . . . . . . . . . . . . 397

General Summary and Implications . . . . . . . . . . . . . . 399

References . . . . . . . . . . . . . . . . . . . . . . . . . 404

# Introduction

The research literature is replete with evidence of the concern educators and psychologists have shown for determining the role of nonintellective factors in learning. This evidence is revealed in numerous research projects involving many different designs, a variety of learning situations, several criteria of learning, a wide span of age groups, and a vast array of predictive variables.

The review of literature reported herein was undertaken to identify learning variables and research designs having implications for future research in situations involving new educational media. Primary emphasis was placed on reviewing studies in which the relationship of characteristics of learners to learning outcomes was explored rather than on studies involving comparisons of the effectiveness of different instructional media. In addition, only studies were included in which the measurement of nonintellective factors was a major objective of the research effort. No attempt was made to exhaust all previous literature on the topic. Rather, studies were reviewed which were considered illustrative of previous attmepts to assess nonintellective factors in a variety of learning situations.

Basic to the synthesis of research finding from this review of literature was a taxonomy for classifying existing studies. After reviewing previous attempts made to classify this type of research literature, and after discarding several preliminary classifications, a taxonomy based upon the following three dimensions was adopted: criterion, sample, and nonintellective factor investigated. The dimension "research design" was omitted since it was found that the majority of studies were correlational in nature. Because of the importance of the design dimension, however, it was felt desirable to comment on this aspect after illustrative studies in each category had been reviewed.

The complete taxonomy used to categorize the studies reviewed in this project, and the system of labeling them, are as follows:

Dimension One: **CRITERION** (Roman Numerals)

I. General grade point average - several courses
II. Specific course outcomes - one course or learning experience
III. Performance on tests related to an experimental condition

Dimension Two: **SAMPLE** (Capital Letters)

A. College or university students
B. Professional school students
C. Junior high or high school students
D. Elementary school students
E. Military personnel or adult nonschool groups

Dimension Three: **NONINTELLECTIVE FACTOR INVESTIGATED** (Arabic Numerals)

1. Measures of adjustment, anxiety, and motivation
2. Measures of attitudes
3. Assessments of personal history and biographical factors
4. Measures of interests and values
5. Indices of study skills and practices
6. Environmental factors related to the learning situation, the school, the community, or the learner's parents.

**This review of literature is organized according to the order of the dimensions: criterion, sample, and nonintellective factors. Interpretive comments are made at the end of each of the five major criterion categories. The references at the end of the report are arranged alphabetically, with page and category indications shown for each citation.**

## I. Criterion Group One: General Grade Point Average

By far the greatest number of researches involving nonintellective factors in learning have utilized general grade point average, or some aspect of it, as the criterion measure. This is probably because of the multiplicity of applications in decision making of this measure as well as its availability to investigators. Titles of published research in this section are illustrated by the following:

"Academic Achievement of College Freshmen in Relation to the Edwards Personal Preference Schedule"

"Use of MMPI Items to Predict College Achievement"

"Biographical Factors Associated with Academic Over and Under-achievement"

"Achievement of Freshman Engineering Students and Their Strong Vocational Interest Blank"

"Effect of Time Between High School and College"

"Predicting Success in Nurses Training"

"Factors Related to the Academic Achievement of High School Students"

"Parental Attitudes and Academic Achievement"

In all the foregoing researches the implication is that one or more aspects of general learning outcomes are related to characteristics of learners. This section contains the studies in which outcomes from several courses or learning experiences have been combined in some manner to form a criterion.

I-A-1 also I-A-3 and I-A-6

ALEXANDER, Norman, and WOODRUFF, Ruth J., "Determinants of College Success", J. Higher Educ., (1940), 11:479-485.

Purpose:

The purpose of this study was to investigate factors promoting academic success and personal development in college.

Procedure:

Information for the study was obtained from high school records, academic records for first semester in college, freshman test scores, expectancy performance defined as degree of success in meeting the academic level predicted by Freshman Week test scores, social development as rated by faculty advisor and two other persons, and a personal data questionnaire.

There were 475 students in the groups studied. The total group was divided into five subgroups on the basis of each of the following factors: academic record in college, freshman test score, expectancy performance, and social development. For example in respect to academic rank, the freshmen were divided into groups A, B, C, D, and E which contained 4, 23, 46, 23, and 4 percent of the total groups respectively. A rank-type correlation was then observed.

Results:

Correlation was high between academic record and social development (rating on appearance, manner, responsibility, emotional balance, use of ability, ease of adjustment, initiative, breadth of interest, ability to win confidence and respect, and tolerance). Seventy-eight percent of those in the highest academic groups fell in high social development groups, and none in lower groups. Only 4% of lowest academic group ranked in two higher social development groups. A close correlation between academic rank and freshman test score was found, but a substantial number of those with high marks for the first semester did not achieve test scores in the highest group, and several with test scores in the high group failed to surpass the median in academic rank.

Supervision of study hours in secondary school, time spent on high school activities, amount of employment in high school, hours spent in high school on class preparation were not closely related to academic rank.

Similarly, factors in university life such as residence on campus, extent of paid employment in college, number of weekends spent off campus, amount of time spent in athletics, and individual vs. groups' study habits did not appear closely related to academic rank. Speed of progress through high school showed some relationship with the seventeen and eighteen year old high school graduates having larger percentages in the high academic group than the nineteen, twenty, and twenty-one year olds.

Those students who had definite vocational plans on entering college tended to dominate the higher academic ranks. Sex and age appeared to be related to freshman test scores with men placing more in high groups. No relation between rank on freshman tests and size of high school was found. And correlation of amount of paid employment in college with test scores was insignificant. But a good academic record in high school was related to high test scores. The same high relationship was found between good academic record in college and high test scores.

Test scores failed to correlate well with hours of preparation in high school and college. But while test scores related very little to number of high school extra-curricular activities, there was marked relationship between high test scores and greater extra-curricular activity in college.

Men students who were self-supporting in college usually met the performance expected of them as predicted by test scores, while women dependent on their own earnings failed to achieve a satisfactory expectancy performance. None of the other factors appeared to have much relationship with satisfactorily meeting an expectancy performance.

As far as social development was concerned, men received higher ratings than women, students of 20 and 21 received higher ratings than those younger, residents at home or in campus houses had higher ratings than those in independent establishments or homes of others, students from high schools with enrollment of 900 or more were ranked higher, but amount of paid employment was not related.

Social development appeared to be significantly related to freshmen intelligence test scores, and high academic rating in college but not with high academic rating in high school. Another significant relationship was between social development and expectancy performance. Almost all who excelled their expectancy quotients conspicuously, achieved or exceeded the average group in social development.

Students with high social development ratings were in general quite positive in their plans to enter college, and somewhat more definite about their vocational plans when entering high school than were others. For men there was also a high correlation between social development and definitions of vocational plans on entering college. The difference in social activity between those with high scores and low scores in social development was more pronounced for women, but men with high social development scores were more apt to participate in athletics more extensively.

Conclusions:

The study indicates that a normal social life usually accompanies academic success. Of the factors studied, only a few determine to an appreciable degree success or failure in college. This points to need for elasticity and individualization of the academic and social program in a university.

I-A-1

ALPERT, R., and HABER, R. N., "Anxiety in Academic Achievement Situations", J. Abnorm. Soc. Psychol., (1960), 61:207-215.

Purpose:

The purpose of the study was fourfold:

(a) To determine the relationship between paper and pencil scales designed to measure general anxiety and scales designed to measure specific anxiety (anxiety specific to test-taking).

(b) To compare the relative efficacy of the general and specific scales as predictors of academic achievement.

(c) To investigate the relationship between the construct of anxiety and that of aptitude.

(d) To investigate the direction of the effect of anxiety upon academic performance.

Setting:

The measures employed were as follows:

(a) General Anxiety Scales
  Taylor Manifest Anxiety Scale (MAS)
  Welsh Anxiety Index (AI)
(b) Specific Anxiety Scales
  Mandler-Sarason Test Anxiety Scale (TAS) (Specific to test-taking)
  Achievement Anxiety Test (AAT-, AAT+) (Has two scales)
(c) Measures of Aptitude
  Scholastic Aptitude Test (SAT)
(d) Measures of Academic Achievement
  College grade-point average
  Mid-term and final examination score
  Course grade in an introductory psychology course

Subjects:

The subjects consisted of several groups of introductory psychology students and freshmen at Stanford University. The N's ranged from 40 to 379 male subjects.

Procedure:

The scales were administered in a classroom setting to the introductory psychology students whereas the freshmen completed them as part of the freshman evaluation program. Scores on the (SAT) and grade-point average were obtained from the registrar, while midterm, final examination, and course grades were obtained from class records. It was felt that the data were representative of the population of introductory psychology students and of the freshmen.

Analysis-Problem A:

To determine the relationship between general and specific anxiety scales, scores on the six different scales were intercorrelated by the product-moment formula. With N = 40, correlations of .32 to .39 were found among the general anxiety scales, correlations of .24 to .38 between general and specific anxiety scales and correlations of .40 to .64 among the specific anxiety scales. In most cases, the r's among specific scales were significantly higher than any r's involving general scales. This indicates that the two types of scales are measuring different factors and should not be substituted for each other. A factor analysis, not shown in this study, supported these findings, but the small N of 40 limits its use.

Analysis - Problem B:

To compare the two types of anxiety scales as predictors of academic achievement, scores on the scales were correlated with college grade-point average, course grade in the introductory psychology course, mid-term examination grade, and final examination grade. N's of 40 to 379 were employed.

The specific anxiety scales were more often significantly correlated with academic performance (9 of 12) than were the general anxiety scales (1 of 11). Thus, not only does it appear that specific and general scales measure different factors, but the variable which the specific scales measure, and which the general scales do not, is involved in academic performance to the extent that specific scales are better predictors of academic success.

Analysis - Problem C:

Because of the feasibility of predicting academic achievement with a measure of some factor other than aptitude, it was desired to test the relationship between aptitude and that factor; consequently, the six measures of anxiety were correlated with a measure of verbal aptitude, the Scholastic Achievement Test (SAT). N's of 40 to 379 were employed in this analysis. None of the general scales and all of the specific scales were significantly correlated at the 5% level with the aptitude test. Two explanations are favored by the authors.

1. There are stress cues connected with the taking of timed college aptitude tests. These cues elicit anxiety responses which affect the aptitude test performance. The specific scales are sensitive to the presence of anxiety of the type reflected in the aptitude tests, but the general scales are not sensitive.

2. The more intelligent the individual, the less anxiety he manifests in test situations, because he has less reason to fear the experience. Both of these explanations favor the use of specific scales over general scales.

These explanations assume that the high correlation between specific anxiety and aptitude is not the result of their measuring the same factor. Separate though related factors are postulated because of the measurement of specific anxiety added to the accuracy of prediction of academic achievement.

Analysis - Problem D:

Since anxiety appears to be a significant variable concerning academic achievement, it was desired to find the direction of the relationship. For an individual there are three possibilities, a facilitation of performance, a deliberation of performance, and no effect at all. Anxiety scales of the past measured the debilitating effect and confounded the other two. The Achievement Anxiety Test (AAT) with its two scales, one to measure facilitation effects, the other to measure debilitation effects, resolves this problem. Now all three effects can be measured. It was found that the addition of the facilitation scale increased significantly the prediction capabilities of the test.

Conclusions:

1. Specific anxiety scales (scales having items specific to the academic test situations) and general anxiety scales are measuring to a significant extent, different things.
2. The specific anxiety scales are better predictors of academic performance than are the general anxiety scales.
3. The general anxiety scales are not significantly related to verbal aptitude, while all the specific anxiety scales are.
4. Even though the specific anxiety scales show a higher correlation with aptitude, it is felt that the anxiety scales are measuring a factor other than aptitude.
5. A scale to measure both the debilitating and the facilitating effect of anxiety was presented.

Implications:

It appears certain that there is a specific type of anxiety present under testing situations. It was shown that specific anxiety is closely related to academic achievement. Evidence was also found that the measures of this specific anxiety were measuring something different from aptitude. It can be concluded, therefore, that specific test anxiety is a non-intellective factor which has a close relationship to academic achievement. Investigation of the direction of effect of the specific anxiety would be of importance. A scale for use in such investigation was introduced in the study.

I-A-1

ANDERSON, L. B., and SPENCER, Patricia A., "Personal Adjustment and Academic Predictability Among College Freshmen", J. Applied Psychol., (1963), 47:97-100.

Purpose:

The objective of this study was to investigate whether or not maladjustment would result in a lesser degree of predicting academic performance. Their hypothesis was that academic ability tests will predict grades less well for a maladjusted group than for a well-adjusted group.

Method:

The subjects used for this study were 1465 freshmen from a liberal arts background, and 620 freshmen from an engineering background. For the purposes of this study, these two groups were investigated separately.

The liberal arts students each took the MMPI and on the basis of the profiles were separated into three groups. One group was considered maladjusted, one well-adjusted, and one normal. Two prediction criteria were used; high school rank and Minnesota Scholastic Aptitude Tests. Grade point average for the freshman year was the criterion variable.

The engineering group was given the MMPI and divided into three groups just as the liberal arts students were. Eleven predictor variables and grade point average for the first quarter were computed. The predictor variables included: high school record, the Minnesota Scholastic Aptitude Test, the Cooperative English Test, the Technology Mathmatics Test, the American College Tests, and the College Entrance Examination Board.

Results:

For the liberal arts group, the bivariate correlation coefficients were computed. All the correlation coefficients for the adjustment groups were significantly different from zero at the .01 level; however, no one adjustment group was significantly better at predicting grade point average.

The engineering freshmen's scores were computed by the bivariate correlation. The majority of the correlation coefficients were significantly different from zero at the .01 level; however, only one prediction variable (American College Testing, Mathematical) differentiated between the three adjustment groups. The well-adjusted group did significantly better on the mathematics test than the other two groups.

Conclusions:

Personal adjustment as defined by using the MMPI clinical scale profiles does not affect academic achievement of liberal arts or engineering freshmen, as demonstrated by grade point average. A well-adjusted or normal group is not more predictable than a maladjusted group.

I-A-1

**ANDERSON**, R. L., "Relationship of Two Selected Non-Intellectual Factors to Academic Success", M. S. Thesis, Colorado State University, (1961).

Purpose:

To determine the grade predicting capacity of two non-intellectual factors: a measure of adjustment and counselor judgment.

Procedure:

The measure of adjustment used in this study was the Rotter Incomplete Sentences Blank. The counselors' judgments were obtained from previous high school teachers of the students participating in the study. A total of 38 freshmen entering CSU in winter quarter, 1961, were involved in this study. Each student was administered the Rotter ISB form, and was evaluated as to college success by a former high school teacher, selected by the student as a teacher knowing his capabilities. These measures were scored and the scores were correlated both singly, jointly, and in combination with college board scores to determine the weight of each measure in predicting grade point average.

Results:

It was hypothesized that counselor judgment and a measure of adjustment would each afford useable criteria for prediction of college grades, and further that counselor judgment would be the better indicator of the two. Correlations of .35 and .33 between Rotter ISB scores and winter quarter and accumulated winter and spring quarter grades respectively were obtained. Correlations of .54 and .51 between counselor prediction and winter and accumulated grades, respectively, were obtained. Both hypotheses were substantiated by these correlations. It was further hypothesized that a combination of the two measures would yield better predictions. A correlation of the combination with grades for winter and accumulated spring yielded .64 and .59, respectively.

Summary:

It was shown that high school teachers were able to predict college success to a fairly reliable degree, and that a measure of adjustment also positively correlated with college success. The combination of the two yielded a larger correlation.

I-A-1     also I-C-1

APPLEZWEIG, M. H., "Educational Levels and MMPI Profiles", J. Clin. Psychol., (1953), 9:340-344.

Purpose:

This study was conducted to determine the applicability of the norms of the MMPI to groups of higher educational and intelligence levels.

Procedure:

The MMPI and the California Capacity Questionnaire, an intelligence test, were administered to 411 subjects from the Denver Public Schools and University of Denver student populations. There were 259 males with a mean age of 24.22 years (sigma = 4.88) mean education 13.88 (sigma = 1.57) and mean intelligence of 122.60 (sigma = 14.7); 152 females with mean age of 24.62 (sigma = 9.99), mean education of 13.83 (sigma = 2.21), and mean intelligence of 111.00 (sigma = 15.00). This sample of subjects was quite different from the MMPI standardization population in education and was assumed to be different in intelligence.

Results:

The mean T-scores of Age, Education and Intelligence level were compared with the Hathaway and McKinley norm mean profile (T score of 50). It was found that the profile of the present male subjects tended toward abnormality on almost all the personality scales and for the validity score with the H and M norm profile.

For age groups (the male subjects were subdivided into age groups of 16-19, 20-23, 24-27, 28-31+) it was found that Mf mean score increases with age, while Sc and Ma show decrease in score with increasing age. Depression scores tend to increase with age, agreeing with earlier findings.

A clear positive relationship was found for males between Mf score and amount of education, while Ma, Pt and Sc scores reverse this pattern. The Depression score does not uphold H and M findings that college and high school graduates received lower scores. The negative relation noted for Psychosthenia is in agreement.

A negative relationship was found between intelligence and Pd, Hs, D and Pt and Sc scores. In addition, both L and F scores decrease with increased intelligence.

For the female group further positive discrepancy with the norm group mean was found. However, the differences were not as marked as for the male group. The female group was divided into age groups of 16-21, 22-27, 28-33, 34+. Scores on Pd, Mf, Pt, Sc and Ma were negatively related to age. The lowest group had the highest scores (in the direction of abnormality) and the scores decreased with increase in age. These trends seem to agree with clinical opinion regarding personality characteristics measured by these scales.

Scores on Pt and Ma were inversely related to educational status while F, Hs, Pd, Mf, Sc and Ma moved toward abnormality with decrease in intelligence. The highest single correlation coefficient for any of the three variables studied and scales of the MMPI was -.37 between education and Sc scale for females. A multiple R of .38 was the largest obtained for age, education and intelligence with Sc and Ma for females. Sixteen correlations were significant, 14 of these negatively.

Differences between total male group of the present study and the norm groups are highly significant at the 1% level for six of the nine scales: D (Critical ratio = 5.36), Hy (CR = 7.14), pd (CR = 5.13), Mf (CR = 8.62), Pt (CR = 2.99), and Hs (CR = 2.06) Sc (CR = 2.18). For females, differences between this sample and norm groups are significant at 1% for five scales: Hy (CR = 3.41), Pd (CR = 2.96), Sc (CR = 3.00), and Ma (CR = 6.70). In all these significant differences the present study group scored higher.

Condlusions:

For use in situations similar to the present study, the general norm group data do not apply for all scales. Until more adequate norms are made available, or further research is account of such differences, it would be best to be cautious in interpreting MMPI profiles for persons in advanced school situations.

I-A-1

APPLEZWEIG, M. H., MOELLER, G. and BURDICK, H., "Multi-Motive Prediction of Academic Success", Psych. Reports, (1956), 2:489-496.

Purpose:

This study was designed to determine the effects of non-intellective variables (achievement motivation and affiliation motivation) upon academic achievement.

Procedure:

Seventy college sophomore women served as subjects. They were tested during regular classes in a general psychology course.

The criterion of academic achievement was grade point average obtained during sophomore year minus the grade point average predicted from score on the verbal portion of the Scholastic Aptitude Test of the College Entrance Examination Board. Thus the criterion was corrected for intellectual ability. It was hoped that the non-intellectual variables (motivational) would permit prediction of the criterion residual (AIi).

Measures of motivation were responses to slides 1BM, 6BM, 20, 7BM, 14, and 4 of the Thematic Apperception Test. The responses were scored for achievement motivation (n Ach) and affiliation motivation (n Aff).

Each subject named 6 "best friends" and a group achievement index (AIg) was found as the average of the six (AIi)s. A check on the validity of the measure of affiliation motivation (n Aff) showed it had not sufficient validity so it was discarded and the (AIg) was used as an affiliation related factor.

Results:

Analysis of variance showed that both variables, friendship group achievement (AIg) ($F = 6.19 < .05$) and achievement motivation (n Ach) ($F = 4.5 < .05$) affected the individual achievement indices (AIi). Correlation of (n Ach) and (AIg) with (AIi) were .16 and .22 respectively.

Conclusions:

1. Achievement motivation as measured by (n Ach) can be a significant factor in predicting academic achievement.

2. One other source of motivation, achievement of friendship groups, also appears to be significantly related. This confirms the author's contention that motives directed toward other goals may lead to achievement oriented behavior and thus supplement (n Ach) in production of such behavior.

I-A-1

ASSUM, A. L. and LEVY, S. J., "A Comparative Study of Academic Ability and Achievement of Two Groups of College Students", _J_. _Educ_. _Psychol_., (1947), 38:307-310.

Purpose:

This study was undertaken to determine how a group of adjusted students compares with a group of maladjusted students regarding scholastic ability and achievement and to determine the correlation between aptitude and achievement between these two groups.

Subjects:

Two groups of 71 students served as subjects. The maladjusted group consisted of students who had sought counseling at the University of Chicago Counseling Center. That they had sought counseling was taken as evidence of maladjustment. The control group was chosen at random and paired with the maladjusted students according to sex, date of entrance into college, and grade level of entry into college. Since they had not had counseling they were considered to be better adjusted.

Procedure:

The following tests were used as measures of aptitude: ACE Q, L and T; the College Reading Ability Score (CRAS); and the College Writing Ability Score (CWAS). The College Comprehension Examination Scores (CCES) served as measures of achievement. The mean scores of each group on each were then compared using a T test and the coefficient of correlation between the average CCES and ACE T was computed.

Findings:

1. There was no statistically significant difference between the mean for the two groups on measures of scholastic aptitude.
2. There was a significant difference in the means of the groups on the CCES (.01 level).
3. The coefficients of correlation between the average CCES and ACE T were .40 for both the maladjusted group and .35 for the adjusted group.

Conclusions:

The maladjusted group of students is comparable in academic ability to the adjusted group. However, in regard to academic achievement, a difference was noted in favor of the adjusted group.

Implications:

Emotional maladjustment may be a cause of underachievement.

I-A-1 also I-A-2

BERGER, E. M., "Willingness to Accept Limitations and College Achievement", J. Counsel. Psychol., (1961), 8:140-146.

Purpose:

The underachievement of certain students with a particular set of attitudes has been interpreted as resulting from a preference not to try hard rather than risk falling below their idealized images. Another way of phrasing the interpretation is that these students are unwilling to accept the inevitable human limitations in themselves now, and are unwilling to accept similarily inevitable limitations that might appear consequent to their best efforts. It would follow then, that those students who are more willing to accept limitations, other things being equal, will achieve at a higher level in college. This is the hypothesis the present study was designed to test.

Setting:

Subjects: The 56 subjects were freshman students entering either the College of Science, Literature and Arts (SLA) or the Institute of Technology (IT) at the University of Minnesota.

Procedure: Subjects were administered a scale designed to measure non-intellective factors in college achievement. Sixteen items of this inventory made up the Willingness to Accept Limitation (WAL) scale. Administration was accomplished during orientation week.

Two groups of subjects were determined by pairing on high school rank, college aptitude as measured by ACE and size of high school; and as different as possible on WAL score. The group that was higher on WAL score actually had a lower mean score on all matching variables. For the IT male students scores on an orientation week math test were also used in matching. All matching was made prior to ascertaining grades.

The criterion of college achievement was first quarter grade point average with A = 4, B = 3, C = 2, D = 1 and F = 0.

Conclusions:

1. The hypothesis "that students high in WAL are likely to achieve at a higher level" is supported.
2. There is, however, a need to obtain more data from larger numbers of subjects. The results for SLA men need to be varified and larger numbers of SLA women and IT men should be used to determine whether the hypothesis would be supported for them also.

I-A-1

BOROW, Henry, "Non-Intellectual Correlates of College Achievement", American Psychologist, (1946), 1:249.

Purpose:

The purpose of this study was to develop an instrument to measure certain non-intellectual characteristics of college students which will aid in the prediction of academic achievement.

Subjects:

Two samples of college students served as subjects. One consisted of 200 women and the other consisted of 190 men.

Procedure:

Three-hundred-and-ninety-nine questionnaire-type items were selected for validation against the criterion of academic overachievement and underachievement. The items were administered to the two samples. Each sample consisted of a group of overachievers (students whose first year GPA was at least one standard error above his predicted GPA) and a group of underachievers (students whose first year GPA was at least one standard error below his predicted GPA). The GPA predictions were based on performance on a freshman test battery (not listed). The items were then subjected to item analysis and the best 90 items were selected. A procedure was then devised and used to group the items by categories each of which presumably dealt with a non-intellectual aspect of academic achievement.

The questionnaire (called the College Inventory of Academic Adjustment) was then validated on a new sample against three criteria - freshman grades, overachievement and underachievement, and selected traits.

Results:

1. The test was divided into six categories: curricular adjustment, maturity of goals and level of aspiration, personal efficiency; planning and use of time, study skills and practices, mental health, and personal relations.
2. The scores on the inventory were significantly related to all three criteria.
3. Split-half and test-retest reliabilities were approximately .90 for both sexes.

Conclusions:

No conclusions were made other than the implicit one that the test is valid..

I-A-1

BURGESS, Elva, "Personality Factors of Over and Under-Achievers in Engineering", J. Educ. Psychol., (1956), 47:89-99.

Purpose:

The purpose of this study was to investigate the hypothesis that students who over-achieve in a college situation have common personality factors which differentiate them from college students who under-achieve.

Subjects:

Samples of 20 over-achievers and 20 under-achievers were drawn from a population of 492 male freshmen engineering students. Selection was made on the basis of a comparison of academic success at the beginning of the fall semester and grade average earned that semester. All subjects were white, unmarried and with the exception of one 22-year-old, all were 18 or 19 at the time of testing.

Procedure:

A battery of tests was administered to all subjects, with the exception of one over-achiever who only took two tests. The tests were: (1) The Rorschach Technique, (2) the MMPI, (3) the TAT, (4) the Rosenweig Picture Frustration Study (RPFS), (5) the Strong Vocational Interest Blank and the College Inventory of Academic Adjustment. In addition, results of the Bernreuter Personality Inventory were obtained from school records.

Tests of significance (t) were made between the means of the scores of the two groups for the following number of variables: (1) Rorschach - 45 variables and 35 signs, (2) the MMPI - 14 variables, (3) the TAT - 17 variables, (4) RPFS - 25 variables, (5) Strong VIB - 2 variables, (6) College Inventory of Academic Adjustment - 7 variables, and the Bernreuter - 6 variables.

Findings:

1. Two Rorschach variables (VIII - X percent and affective ratio) were in favor of the under-achievers and significant at the .02 level. Six signs were significant. They were (1) Ap is W, (W) or D (at the .01 level), (2) A% 50% or less (.02 level), (3) Affective ratio 0.65 or less (.02 level), (4) no poor form quality (F) or pure C on card IX (.01 level), (5) FC equal to or greater than CF (.05 level), and (6) percent of responses to last three cards 40 to 60% (.01 level).

2. TAT variables revealed that over-achievers scored higher in need for achievement (.01 level of sig.), needs to be aggressive (.02 level), need to improve self or status (.01 level). Under-achievers scored higher (.01 level of sig.) in the number of needs to be dependent.

3. No significant difference was found for any of the MMPI variables, although the scores suggest a tendency for over-achievers to score higher on the Hs scale and for under-achievers to score higher on the Mf scale.

4. All seven variables of the College Adjustment Inventory were in favor of the over-achievers with all but one variable (mental health) at the .01 level.

5. No significant differences were uncovered by the RPFS, the Strong or the Bernreuter.

Conclusions:

The hypothesis is supported:

1. Over-achievers are less labile in their affective reactions, tend more toward construction and are more inhibited in emotional response to pleasurable aspects of the environment. Intellectual adaptivity is greater, the approach to problems more cautious, and intellectual control of emotional reaction is greater. Need for achievement and improvement of self and status is greater. They show more need to be aggressive.

2. Under-achievers are less intellectually adaptive, over-généralize and over-extend the self and show less intellectual control. They are more emotionally expressive. Motivation for achievement is weak.

3. The TAT is the most useful instrument for a research approach to the study of personality and achievement. The Bernreuter, MMPI, Strong, and RPFS tests, as conventional scores, are not suitable instruments for differentiating groups of academic deviates.

Implications:

Findings for the Occupational Level Key of the Strong for men suggest that further research might reveal a standard score below 40 on that scale to be indicative of under-achievement.

I-A-1

CENTI, Paul, "Personality Factors Related to College Success", J. Educ. Res., (1962), 55:187-188.

Purpose:

To determine the differences between the highest (H) and the lowest (L) ranking students in the day session of the School of Education of a large urban university with respect to their personality and adjustment as indicated by scores on the MMPI and the College Inventory of Academic Adjustment.

Method:

Subjects: 64 full-time students enrolled during 1955-56 school year. The H and L students were chosen on the basis of the first semester GPA's. Method: Each subject completed the MMPI and the CIAA. The test scores of the H and L subjects were tested for significance by the analysis of variance technique and the "T" test of significance. The .01 level of significance was employed.

Results:

Analysis of the scores on the MMPI revealed that lowest ranking students in each class, in general, scored higher mean scores than did the corresponding highest ranking subjects on nine scales of the MMPI. The differences which were found to be significant were those between the H and L juniors on the following five scales: Hs, D, Hy, Pt, and Sc. In addition, the combined lowest ranking group was found to have significantly higher mean scores than did the total highest ranking group in the following four scales: Hs, Hy, Pt and Sc. In the freshman class, the lowest ranking subjects had nine high scores (t score of 70) as compared with three for the highest ranking freshmen. In the sophomore class, L = 12, and H = 1.

The highest ranking juniors had only 5 high scores, while the lowest had 24. In the senior class, the highest ranking subjects had no high scores on any of the scales and the lowest ranking students had only one high score. For the CIAA, the mean differences in the freshman class were not significant. In the sophomore class the mean composite inventory score and the mean personal efficiency score were significantly higher than those of the lowest (high scores indicate better adjustment). The high ranking juniors had significantly better scores on the composite inventory score, the curricular adjustment score, and the maturity of goals and level of aspiration score, the personal efficiency score, the study skills and practices score, and the mental health score. For seniors, significant differences favoring high ranking seniors were obtained for the composite inventory score, the maturity level of aspiration score, the personal efficiency score, and mental health.

Conclusions:

Scores on the MMPI and CIAA indicated in general that the highest ranking subjects tended to be better adjusted than were lowest ranking subjects. It was mentioned that the relationship existing between emotional adjustment and level of achievement is probably not a direct one. It was concluded that the emotional adjustment of the subject affects his level of achievement by affecting the degree to which use is made of his potential.

CHAHBAZI, P., "Use of Projective Tests in Predicting College Achievement", Educ. Psychol. Measmt., (1960), 20:839-842.

Purpose:

To investigate the long-range prediction of academic achievement in New York State College of Agriculture at Cornell University on the basis of protocals from two projective tests.

Setting:

The prediction variables were the n-achievement scores on the two projective tests, PST and SST. Subjects were 197 students in the College of Agriculture at Cornell. Cumulative averages were used as the criterion variable. No estimates of reliability were available for the marks in any of the courses. For the 197 students, validaties were computed for the two tests.

Results:

The validity coefficient for PST drops from .35 with first-term averages as criterion to .31 with cumulative averages and the one for SST from .46 to .39. Therefore, although the two tests are a little better predictors of the first-term averages, neither of the two is a good predictor of the cumulative averages. The coefficient of correlation between first-term averages and cumulative averages was .76.

Conclusions:

First-term averages seem to be the best predictors of the students' college achievement. The two projective tests are fairly good predictors of the first-term averages but not of the cumulative averages.

I-A-1

CHAMBERS, F. M., "Empathy and Scholastic Success", Personnel and Guid. J., (1957), 36:282-284.

Purpose:

It was hypothesized that in learning situations which were similar, students with greater empathic ability would be more successful than those with low empathic ability.

Procedure:

Two hundred college student roommates were administered a test of empathy. They had roomed together for six months and had completed one semester of the freshman year.

Fifty-five subjects who had taken three common courses were selected for study. The average grade point ratio in these three common courses was used for data in the experiment. The instrument selected to measure empathic ability used a technique, suggested by Dymond, to measure the disparity between a subject's predictions of the responses of an associate and the responses which an associate actually makes. The total deviation is assumed to be a measure of empathic ability - the smaller the deviation, the better the empathy score. The test of empathy was devised by Bender and Hastorf and provides a refined empathy score corrected for the effects of projection.

Results:

Those subjects with scores above the mean (-5) of the range of empathy scores have, in general, higher grade point averages than those in the lower half of the range.

The following linear correlations were obtained: empathy test score and ACE-L score correlated .16; empathy score and grade point ratio correlated .37; and ACE-L score and grade point ratio correlated .62. The latter two r's were significant at the 1% level.

The following partial correlations were obtained: grade point ratio and ACE-L score correlated .61; grade point ratio and empathy score correlated .35; and ACE-L score and empathy score correlated -.1. The former two r's are significant at the 1% level.

Conclusions:

It may be concluded that empathy and scholastic aptitude as measured in this study are different abilities and each contributes significantly to scholastic success.

I-A-1 also I-A-4 and I-A-5

COBLENTZ, I., "Prognosis of Freshman Academic Achievement at the Penn State College", Unpublished Ph.D. Thesis, (1942), Penn State College.

Problem:

To determine the relationship of subscores on the Moore-Nell Examination, high school rank, personality traits, interest measure, and studiousness index scale, with first semester grade point average for the schools of Chemistry and Physics, Engineering, Mineral Industries, and Lower Division and School of Agriculture.

Procedure:

Test instruments employed were the Moore-Nell Examination, Strong Vocational Interest Blank, Studiousness Index, Bernreuter Personality Inventory and high school rank.

Criterion of academic success was first semester GPA. This was correlated with scores on each of the measures within each of the schools.

Results:

Parts of the Moore-Nell examination had median correlations with the criterion, as follows: Vocabulary (.287), Paragraph reading (.220), Arithmetic Processes (.351), English Usage (.326), Algebra, (.526). Correlations of high school rank with first semester average ranged from .340 to .573 for the seven schools. Correlations computed between GPA in the various schools and various occupational interest scales of the Strong, and the stability, self-sufficiency, and dominance traits of the Bernreuter Personality Inventory showed the following: significant correlations of scores on Chemist and Life Insurance salesman scales with GPA in mineral industries were found (.354 and -.299, respectively). The dominance scale combined with high school rank, Vocabulary, Arithmetic Processes and the Life Insurance Scale correlated .757 with GPA in the School of Agriculture.

The studiousness index measure showed significant correlation with first semester GPA for Mineral Industries School. A multiple r of the studiousness index, Chemist Interest Scale, high school rank, Arithmetic Processes, English Usage, and Algebra test with GPA in Mineral Industries was .796.

Regression equations comprising high school rank and selected Moore-Nell test parts were developed for prediction of grades in Chemistry I for schools of Chemistry and Physics was .680 and for Mineral Industries, .674. Miltiple r with Mathematics for school of Chemistry and Physics was .601, for Engineering .536, and for Mineral Industries .701. The probable errors of estimate of these r's were too high for confident prediction.

DEMOS, G. D. and SPOLYAR, L. J., "Academic Achievement of College Freshmen in Relation to the Edwards Personal Preference Schedule", Educ. Psychol. Measmt., (1961), 21:473-479.

Problem:

The major hypothesis of this study was: Students who were achieving at or above the grade point level expected of them on the basis of their scholastic aptitude had significantly different manifest needs of certain variables than those students who were not achieving.

Method:

Subjects: 245 students (males and females) at Long Beach State College. The groups were compared as follows:

(1) Achievers - achieving students of high scholastic aptitude.
(2) Underachievers - nonachieving students of high scholastic aptitude.
(3) Overachievers - achieving students of low scholastic aptitude.
(4) Nonachievers - nonachieving students of low scholastic aptitude.

The students were placed and selected by the College Ability Test (SCAT) and cumulative grade point averages (GPA) for two semesters of academic work.

Group I, the achievers, scored at or above the 90th percentile on the SCAT and maintained a GPA that was above the freshman GPA. Fifty-one students were in this category.
Group II, the underachievers, scored at or above the 90th percentile on the SCAT and maintained a GPA that was below all-freshmen GPA of 2.47. Seventy-six were in this group.
Group III, the overachievers, was randomly selected from a list of students who scored below the all-freshmen mean on the SCAT and maintained a GPA that was above the all-freshmen GPA. Forty-two students were in this group.
Group IV, the nonachievers, was randomly selected from a list of students who scored below the all-freshmen mean on the SCAT and maintained a GPA that was below the all-freshmen GPA. Seventy-six students were in this group.

The statistical analysis consisted of making various comparisons of mean raw scores among the 15 variables in the EPPS. The t-ratio was employed to test the significance of the difference between the means. Group I achievers were compared with Group II underachievers.

Results:

There were no significant differences between the groups compared on any of the variables of the EPPS.

Summary:

No significant differences between the achievers and underachievers and between the overachievers and nonachievers were found. The study failed to establish the value of the instrument in either predicting academic achievement or diagnosing any difficulties that a student may have in view of his manifest needs. It seems that the counselor and teacher should be wary of using this kind of instrument with this problem, and perhaps a less dogmatic stand needs to be taken on the question of whether a student is actually over or underachieving.

I-A-1

DOLEYS, E. J. and RENZAGLIA, G. A., "Accuracy of Student Prediction of College Grades", Personnel and Guid. J., (1963), 41:528-530.

Purpose:

To determine the relationship between self-estimate and actual college grades, and to compare this with the accuracy of predicting grades by the use of a standard scholastic aptitude test. To note whether adding such self-predictions to psychometric predictions would significantly increase the accuracy of predicting college grades; and to determine whether measured intelligence is related to this ability to predict college grades.

Method:

The subjects were 211 first-quarter freshmen at Southern Illinois University. To insure representativeness, the subjects were taken from one advanced section of English, six regular sections, and three remedial sections, corresponding to the approximate proportions of the total freshman class in each of the three types of sections. Self-estimates of grade point averages were obtained in the classrooms at the regular time scheduled for the English class. The subjects were asked to indicate how they expected to perform in their first two quarters of college by marking an X on a scale ranging from A (5) to E (1). The scale was subdivided into tenths of a point. Groups were contacted before they had any hunches about their GP. The SCAT was used as a criterion variable.

Official transcripts of subjects grades were obtained at the end of the winter (second) quarter of the academic year. From these, grade point averages were computed on the same scale as that was used for self-estimates. Subjects who failed to complete the two quarters of course work were not used in the analysis, leaving total of 138 subjects on which the results were based.

Results:

Self-estimates were not as effective a predictor of earned grade point average as were the SCAT total scores. The difference between the two correlations was found to be at the .05 level. The multiple r between the two predictors (self-estimated and SCAT total scores) and earned grade point average was .65. The r between SCAT and GPA was .63. The r coefficient between estimated and actual grade point average in college was .41. Comparison of the means and standard deviations of the self-estimates of grade point averages indicated that self-estimates of grades tend to be higher and less variable than the grades actually earned. A fraction comparing the variances of each of the groups was significant at better than the .01 level. The correlation between SCAT total score and difference between actual and estimated grade point averages was -0.13 which failed to reach significance at the .05 level.

Summary:

(1) Self-estimates of college grades are significantly accurate predictors of college grades. They are, however, significantly less accurate predictors of this behavior than are predictions made from scores on the SCAT. (2) Self-predictions do not account for variance in college grades significantly different from the SCAT scores when they

are combined in a multiple correlation. (3) College freshmen as a group tend to overestimate their performance in college, and their estimates of grade point average are less variable than are the actual grade point averages. (4) Intellectually, more able subjects tend to underestimate or accurately estimate their college performance while less able students tend to overestimate their future grades.

DROUGHT, N., "An Analysis of Eight Measures of Personality and Adjustment in Relation to Relative Scholastic Achievement", J. Applied Psychol. (1938), 22:597-606.

Purpose:

To account for the personal-social-emotional factors operative in scholastic achievement.

Subjects:

Seven hundred and fifty freshman men entering College of Letters and Science of the Universtiy of Wisconsin, September, 1935.

Procedure:

The Adjustment Inventory by Hugh Bell and the Wisconsin Scale of Personality Traits by Ross Stagner were administered to 750 freshman men on entering college.

The Bell Inventory provided measures of home, health, social and emotional adjustment.

The Stagner Scale contained four divisions:

1. W scale - (nervousness and emotionality)
2. X scale - (introversion)
3. Y scale - (self-esteem, self-confidence)
4. Z scale - (social passivity or seclusiveness)

The criterion of scholastic achievement was the discrepancy between predicted and achieved grade point averages. A regression equation was used.

Correlations were determined between grade point discrepancies and scores on each of the subdivisions of the Bell and Stagner Scales. No reliable relationship was found.

Determination was made of the extent the scales differentiated between students of at least ± 1 1/2 PE (N = 250).

Average grade point discrepancies were determined for students with ratings of "excellent" and "unsatisfactory" on each of the Bell Inventory and for students scoring in the lowest and highest deciles of the four divisions of the Stagner Scale. Differences between the mean grade point discrepancies was found to be at least four times the probable error of this difference for students scoring high and for those scoring low on the X and Z scales of the Stagner measure indicating introversion and social passivity.

Item analysis led to a description of the poor student in that he: (Bell)

1. does not feel self conscious because of personal appearance.
2. is in doubt as to whether or not he is often the center of favorable attention at a party.
3. has not frequently had to keep quiet or leave the house in order to have peace at home.
4. enjoys social dancing.

5. does not get discouraged easily.
6. does like to participate in festive gatherings and make "whoopie".
7. does hesitate to enter a room by himself when others are in it.
8. does not sometimes envy the happiness others seem to enjoy.
9. does not cross the street to avoid meeting somebody.
10. does take the responsibility for introducing people at a party.

(Stagner)

1. does not like to be by himself.
2. does not indulge in daydreams.
3. does not like to have quiet amusements rather than exciting ones.
4. does not get tired or work quickly.
5. does not like to spend his vacations at some quiet place rather than a lively resort.
6. does not think much about it when praised.
7. is not often considerably upset when unsuccessful in any undertaking.
8. does not usually think a great deal before deciding anything.
9. would not like to listen to a lecture or classical music.
10. does not usually talk spontaneously.

Conclusions:

The tests were of little effectiveness in differentiating between students. There was no relationship found between adjustment as measured and relative performance in college.

A correlation of +.20 was found between the twenty items selected and grade point discrepancies.

DURFLINGER, Glenn W., "Scholastic Prediction in a Teachers College", J. Exper. Educ., (1943), 11:257-267.

Purpose:

This investigation was designed to evaluate several variables for the prediction of scholastic achievement and to determine their factorial relationship to GPA.

Procedure:

Three hundred and twenty-one students (213 women and 108 men) at Nebraska State Teachers College were administered the Bernreuter Personality Inventory, the Providence Music Test and unspecified college aptitude, elementary achievement, personal data and English tests. Each subject's fall GPA was also obtained. Zero order correlations were computed between the possible combinations of the seven variables. Multiple correlations were then correlated between various combinations of the predictor variables and GPA. Finally, in an attempt to determine the factors involved in college grades, Thurston's centroid method of factor analysis was used.

Results:

1. The highest zero-order correlations were between intelligence and English, .511 for men, .506 for women and .508 total. 2. English correlated highest with GPA, .511 for men, .506 for women and .508 total. 3. The multiple correlations using all six variables to predict GPA were .543 for men, .562 for women and .562 total. 4. The most economical multiple correlation uses the achievement and English tests and correlates .533 for men, .542 for women and .539 total. 5. English and achievement have the largest weight in the regression equations. 6. The music and personality tests are of insignificant value in the prediction of GPA. 7. The factor analysis reveals that there is a general factor running through all the variables. In addition, there is one group factor which is found in four tests for the men and three tests for the women and total group. Also, there are indications that there are specific factors in each test which are not identified in this study.

Conclusions:

1. The English and achievement tests are the best predictors of GPA. 2. The value of each test in prediction differs for the two sexes. Therefore, separate regression equations should be formulated for each sex. 3. Women's grades can be predicted slightly more accurately than men's grades. 4. The factors in GPA which are components of the tests count for less than half of the factorial content of grades.

ERB, E. D., "Conformity and Achievement in College", Pers. and Guid. J., Sept. 1960-May 1961, 39:361-366.

Purpose:

To test the hypothesis that high conformity groups both male and female students will receive significantly higher grade point averages than will low conformity groups, and to investigate conformity on several cognitive levels: (1) self most like me, (2) self least like me, (3) ideal self most like me, (4) ideal self least like me, (5) total conformity.

Method:

One hundred subjects of presumably similar ability were administered a Q sort. Sorts were obtained for "self as you are" and "self as you would like to be".

The Q sort was developed empirically by the author for the investigation of cognitive structures thought to be related to academic achievement. It contained 60 items divided into three areas and four valences. The areas were self, teachers, and educational ideas; the valences were positive, neutral, ambivalent, and negative. A forces-sort procedure was used calling for placement of the 60 items by the subject along a contiuum from "most like me" to "least like me" according to the following distribution: 3 5 7 9 12 9 7 5 3.

Conformity scores were calculated using the six placements in the two end boxes only since it was felt that the sharpest distinctions made by subjects would occur using these extreme categories of acceptance and rejection. Each item was thus assigned a conformity value according to commonality of placement in these categories.

The procedure was repeated for both self and ideal self sorts. Low scores signified high conformity and high scores, low conformity. All items were assigned a rank order conformity value for each of the four categories, for example, in the"self sort" if subject placed items 39, 4 3 in the most like me category and they had a rank order value of 8, 2, and 1, his conformity score would be 11. The same calculation was then made for "least like me", etc.

Conformity therefore is conformity to the perceptions of the group itself and not to external criteria. The degree of conformity for males and females was then compared by using the T test. The dependent variable upon which these groups were compared was the grade point average.

Results:

The mean conformity score for the males was 155 and for the females was 120 which was a significant difference revealing that females were more conforming. The difference in achievement in every instance was in favor of the high conformity group for females in college grade achievement. However, "most like me" conformity on both the attitude and ideal attitude levels did not discriminate between achievement groups. The null hypothesis that male conformity groups are the same in achievement could not be rejected. The analysis for males was carried out again using just conformity scores based upon male placements. The null hypothesis again could not be rejected.

Summary and Conclusions:

Conformity was found to be significantly higher for females than for males. An empirical measure of conformity was developed based upon the degree of commonality in Q sort behavior which appears to have considerable potential for future research into the optimum conditions.

I-A-1

FLEMMING, E. G., "College Achievement, Intelligence, Personality, and Emotions, J. Applied Psychol., (1932), 16:668-674.

Purpose:

This study was designed to determine the relationship between college grade average for one semester and intelligence, personality, and emotion.

Procedure:

Eighty-nine college men, mostly sophomores and some juniors and seniors served as subjects. These men had an opportunity to know each other for over a year. The Thorndike Test was used to measure intelligence, the Colgate Schedule C-2 was used as the measure of introversion-extroversion, and as a measure of emotional response a revised version of the Pressey X-0 Test was employed.

Parts I, III, and IV of the Pressey X-0 Test were used, and four different scores were calculated from it. These four scores were taken to measure (1) intensity of emotional response, (2) variability of intensity, (3) deviation of emotion regardless of direction, and (4) emotional consistency.

Furthermore, each subject was rated by his fellow students on pleasingness of personality, emotional steadiness, emotional expressiveness, and social adjustment. The average rating by all students in the Elementary Psychology class of each subject was found.

Results:

The measures and ratings were correlated with grades. Significant correlations were found between grades and intelligence (.37), measured on Thorndike; emotional steadiness (-.30), those rated as emotionally steady got higher grades; emotional consistency (-.29) measured on Pressey X-0; and introversion (.26).

Multiple correlation of grades with emotional steadiness added to intelligence was .47. When emotional consistency was added to intelligence R = .41. Introversion added to intelligence yielded R = .42. In each case something is added from another measure than that of just intelligence. A composite score of all measures yielded a correlation of .67 with grades.

Conclusion:

From a knowledge of the Thorndike score of a student in college, with his score on the Colgate Schedule C-2, an estimate of his emotional steadiness, and a measure of his emotional consistency from the Flemming revision of the Pressey X-0 Test, it is possible to predict with some assurance the academic achievement of the college man in terms of grades.

I-A-1

FRICK, J. W., and KEENER, Helen E., "A Validation Study of the Prediction of College Achievement", J. Applied Psychol., (1956), 40:251-252.

Purpose:

In a previous study, Frick (1955) presented findings of an attempt to improve prediction of college freshman academic achievement by using the MMPI in conjunction with the usual scholastic aptitude test (ACE). Results indicated that a coefficient of determination from a weighted composite of aptitude and personality was .41 while that derived from aptitude was only .23. A regression equation derived from the ACE and six clinical scales of the MMPI was given for prediction of GPA, based on an experimental group. The present study is an attempt at cross-validation of the previous findings with a similar group.

Procedure:

The cross-validation group was selected on the same basis as the experimental group, completion of two semesters of freshman year, a score on the ACE, and a research valid score on the MMPI.

Means and standard deviations on the relevant variables for the two groups were computed and compared. Distributions and scatter plots of the scores on all variables for the validation group indicated a similarity to those found for the experimental group, with symmetry and linearity in all scales except GPA and D scale of MMPI. As was done with the experimental group, these two scales were normalized by T-scaling.

Scores on each predictor variable for each individual of the validation group were inserted into the following regression equations. $X^1 = 79.6 + .1476 - 5490\ Hs - .0125\ D - .90.2\ Pd + 1.0127\ Pa - .4592\ Sc - .4523\ Ma$. In this equation $X^1$ = the predicted GPA (in T scores) for the individual, while the other terms represent the sum of a constant plus weighted individual scores on the ACE and selected MMPI scales.

After a predicted GPA was computed for each individual, they were correlated with obtained GPA for the group of 200 subjects.

Results:

The original multiple correlation between GPA and a weighted composite of ACE and MMPI scales in the experimental group was a .64. In the validation group it was .54. In the same group the zero order correlation between GPA and ACE was .50. In this group, therefore, the coefficient of determination of .25 yielded by the ACE scores above was slightly higher (.02) than that found in the experimental group, while the coefficient of multiple determination of .30 was considerably lower (.11). The shrinkage in correlation from experimental to validation groups between prediction variables and the criterion appeared to have been subject to regression phenomenon common to predictive equations derived by the least squares method, and probably magnified by the use of seven independent variables in the equation.

I-A-1

FRICK, J. W., "Improving the Prediction of Academic Achievement by Use of the MMPI", J. Applied Psychol., (1955), 39:49-52.

Purpose:

This study was undertaken to test the hypothesis that in a relatively homogeneous college population the prediction of academic achievement will be enhanced, over that afforded by a test of aptitude alone, by the inclusion of personality variables in a predictive battery and the utilization of all information available in the data by means of correlational procedures.

Subjects:

Two-hundred-and-sixty-seven University of California freshman women (mean age of 18.3 years) served as subjects in this study.

Criterion:

Freshman year (two semesters) grade point averages corrected for errors of measurement were used as the criterion for this study.

Procedure:

Upon admission all students had taken the ACE and MMPI; to be included in the sample, each subjects... "validating scales on the MMPI had to be within acceptable limits for research purposes. The average profile of the subjects was compared with profiles from Midwestern and an Eastern group of similar composition (age, sex, IQ level) and found to be comparable. ACE percentile scores were used. Except for the D scale, raw scores, plus K, were used for the MMPI scales.

Findings:

Using all variables, a multiple correlation coefficient of .64 was obtained. An R of .65 was obtained when the Hy and Pt scales were excluded.

Correlations between the MMPI scales and the ACE-L score and ACE-Q score were not significantly different. The GPA correlated .38 with the ACE-Q and .39 with the ACE-L.

With the exception of the Pa scale (R = .13) all of the MMPI scales correlated negatively with GPA. Significant at the 1% level were the negative correlations between GPA and the Pd scale (-.32), the Sc scale (-.16), and the Ma scale (-.27). Hs correlated -.15 with GPA which was significant at the 5% level.

From the coefficients of determination, it was found that 23% of the GPA variance was accounted for by ACE alone. The coefficient of multiple determination indicated that 41% of GPA variance can be accounted for by a weighted combination of ACE scores and MMPI scales.

Conclusions:

"This study indicates that, whether the influence of the individual adjustment scales is positive or negative, their inclusion in a prediction battery with an aptitude test is justified by the resultant increase in the coefficient of determination."

GEBHART, G. Gary, and HOYT, Donald P., "Personality Needs of Under- and Over-Achievers", J. Applied Psychol., (1958), 42, 2:125-128.

Purpose:

The major purpose was to investigate some personality correlates of over- and under-achievement while avoiding experimental weaknesses of earlier studies. This attempt to control variables previously neglected led to three subsidiary purposes. They were to investigate whether or not subjects at different ability levels had different personality needs; to determine whether or not the personality correlates of over- and under-achievement were the same at various ability levels; to investigate personality differences between groups having differing vocational orientations.

Procedure:

Four-hundred-thirty engineering students and 310 Arts and Sciences students were originally considered on the basis of their scores on a Pre-Engineering Ability Test for the Engineers and scores on the ACE for the Arts and Science students. From these scores, predictions of grade point averages (GPA) were made. For each school group if a subject's predicted GPA was over 1.30 out of 3.0, he was defined as a high ability student. Those with predicted GPA less than .70 out of 3.0 were defined as low ability students. Those between 1.30 and .70 were average students.

On the basis of first semester grades the two school groups were further divided into over- and under-achievers. If a student's obtained GPA was higher than predicted, he was defined as an over-achiever and an under-achiever with obtained GPA less than predicted GPA.

The divisions provided 12 groups (2 schools, 3 ability levels and 2 levels of achievement). The 12 groups were examined separately and in each group the 20 subjects with GPAs most discrepant from their predicted GPAs were included in the sample.

Scores on each of the 16 scales of the Edwards Personal Preference Schedule (EPPS) obtained from the freshman testing program were collected for the sample of 240 subjects. The analysis employed a factorial design (2 schools x 3 ability levels x 2 achievement levels) for which analysis of variance was computed. A total of 16 analyses (one for each EPPS scale) were made.

Results:

Of the 16 major null hypotheses, (no differences between over- and under-achievers on a particular EPPS scale) seven were rejected at the 5% level or better. Over-achievers scored significantly higher on scales of Achievement, Order, Intraception and Consistency. Under-achievers scored significantly higher on Nurturance, Affiliation and Change.

Of the 16 subsidiary null hypotheses, (no differences among high average and low ability groups on a particular EPPS scale) nine were rejected at the 5% level. High ability groups scored consistently and significantly higher on Achievement, Exhibition, Anatomy, Dominance, and Consistency scales. Low ability groups scored consistently and significantly higher on Deference, Order, Abasement and Nurturance scales.

Of the 15 subsidiary null hypotheses, i.e., no differences attributable to the interaction of ability and achievement obtained among groups, on a particular EPPS scale, two were rejected at the 5% level. Thus, only for the scales of Heterosexuality and Consistency can it be inferred that there is an interaction between achievement level and ability level. High ability groups tended to score higher on the Heterosexuality need. Also, underachievers tended to score higher than overachievers, but, low ability overachievers scored higher than low ability underachievers. On the consistency scale, overachievers scored higher than underachievers, high ability groups scored higher than low ability groups; yet high ability underachievers scored higher than high ability overachievers.

Of the 16 subsidiary null hypotheses that no EPPS differences would be found between students in the two schools, fourteen were rejected. Engineering groups scored higher on Endurance ($p < .001$) whereas Arts and Sciences students scored higher on Dominance ($p < .05$).

Conclusions:

1. Overachievers scored significantly higher than underachievers on the Achievement, Order, Intraception, and Consistency scales and significantly lower on Nurturance, Affiliation and Change scales.
2. High ability subjects scored significantly higher than those of low ability on the Achievement, Exhibition, Autonomy, Dominance, and Consistency scales, and significantly lower on Deference, Order, Abasement and Nurturance scales.
3. Engineering students scored significantly higher than Arts and Science students on scale of Endurance, and significantly lower on Dominance.
4. Two interactions between ability and achievement levels, and ability were found, one on Heterosexuality scale and the other on the Consistency scale.
5. It can be hypothesized:
    a. that overachievement is associated with either a drive to complete (achievement), a drive to plan (order) or a drive of intellectual curiosity (intraception).
    b. that underachievement is associated with either a need for variety (change), or social motives (affiliation and nurturance).

The fact that these scores do not correlate highly supports the notion that several relatively distinct patterns, rather than a single pattern of either over or underachievement are involved.

I-A-1

GOODSTEIN, L. D. and HEILBRUN, A. B., "Prediction of College Achievement from the Edwards Personal Preference Schedule of Three Levels of Intellectual Ability", J. Applied Psychol., (1962), 46, 5:317-320.

Purpose:

While tests of scholastic aptitude or intelligence are quite useful for predicting academic success, it is typical that such measures account for less than half of the variance in academic performance. Because of this fact, considerable interest has developed about the possible use of nonintellectual factors, especially personality variables, as additional sources of variance; and consequently about the use of personality measures as predictors of academic success.

The Edwards Personal Preference Schedule (EPPS) would appear to be especially useful in this respect because many of the personality factors topped by this instrument are locally related to academic success. In past studies, the EPPS has been used to predict academic success in high school (Klett, 1957) and to study the special problems of over and underachievers in college (Gebhart and Hoyt, 1958 and Krug, 1959). The 1958 and 1959 studies yielded positive results. The present study, rather than dealing with selected groups of over and underachievers, is concerned with the contribution of the EPPS to the prediction of academic success over the whole range of scholastic ability in undergraduate college students.

Procedure:

The subjects consisted of 357 (206 male and 151 female) undergraduate students in two elementary psychology courses at the State University of Iowa. All were administered the EPPS early in the semester under standard conditions. Scores on a 20 minute, 60 item vocabulary test taken upon entrance to the university were available. Scores on this test have correlated from .45 to .55, with N = 500, with academic success, and .70, with N = 500, with the revised Henmon - Nelson Test of Mental Ability. At the conclusion of the semester grade point averages (GPA) for each student for all courses that semester were secured from the registrar.

Results:

Product-moment correlations between GPA and vocabulary test scores were .46 for male and .42 for females (both significant at .01 level). Correlations between EPPS scale scores and vocabulary test scores ranged from -.23 to .37, about 20% of them significant at the .05 level.

Partial correlations between the 15 EPPS scales and GPA, with variance due to intelligence as measured by the vocabulary test partialed out, were computed for all males and all females in separate groups. The Achievement scale correlated .24 (significant at .01 level) for the males, but none of the scales correlated significantly for the females.

These essentially negative results with students of a wide range of intellectual ability suggest that personality correlates of college achievement may be specifically tied to ability levels and that these relationships are masked in the type of analysis which fails to consider levels. To investigate this possibility, the two sex groups were each separated into three equal size subgroups of Low, Middle and High intellectual ability according to scores on the vocabulary test.

Product-moment correlations between GPA, vocabulary test scores and the 15 EPPS scales were computed for each of the six subgroups. For males, correlation between vocabulary test scores and GPA was .28 for Low ability, .11 for Middle ability and .33 for High ability groups; while for females the correlations were .32, -.05, and .40, respectively. Correlations between vocabulary test scores and EPPS scales ranged from -.32 to .42 with about 25% of them significant at .05 level.

Again partial correlations between the 15 EPPS scales and GPA with variance due to intelligence partialed out were computed for each of the subgroups. For the Low ability males, Autonomy and Nurturance are negatively correlated with GPA; for Middle ability males, Achievement and Endurance are positively correlated while Affiliation, Intraception, Nurturance, and Change were negatively correlated with GPA; and for the High ability males, Aggression is negatively correlated with GPA. For the Low ability females, Abasement and Nurturance are negatively correlated with GPA; for High ability females, Intraception is positively correlated with GPA. None of the partial correlations on Middle ability females were significant.

Conclusions:

The contention that personality factors are significantly related to academic success, when the influence of academic ability is removed is supported. But the relationships depend on the ability level of the groups being studied. When level of ability is ignored, the relationships may be concealed.

The personality factors related at different ability levels are quite different. In only one instance out of eleven was a given personality correlate of achievement found at more than one level.

A possible interpretation of the results is that personality factors are most important in determining academic success of the average ability male. Success of the relatively bright and dull males is more determined by intellectual factors.

I-A-1

GOUGH, Harrison G., "The Construction of Personality Scale to Predict Academic Achievement", J. Applied Psychol., (1953), 37:361-366.

Purpose:

This study was undertaken to develop a personality scale which could be used to predict course grades - partially college undergraduates grades in psychology courses.

Subjects:

Item analysis group - 603 students in introductory psychology classes at the University of California, the University of Minnesota, and Vanderbilt University were the subjects.

Cross-validation groups - 336 students were administered the 36-item scale. Nine-hundred-and-seventeen students were given the 32-item scale as part of a larger inventory. One-thousand-one-hundred-and-eight high school students, 40 senior medical students, and 150 military officers were also given the 32-item scale as part of a larger inventory.

Procedure:

Part I: Item analysis indicated 150 items of discriminatory power and from these a 36-item scale was developed (16 of these items were from the MMPI). After the first cross-validation, four items dealing with present school attendance were eliminated and the remaining 32 items were included in the California Psychology Inventory as the Hr (honor point ratio) scale. This inventory was then administered to the remaining subjects used in this study.

Part II: A composite adjective check list, derived from the staff members rating of each assessee using the Gough Adjective Check List, was obtained for each of 20 of the graduates and 10 of the medical students who had the highest Hr scores and for the same number of the same groups who had the lowest Hr scores. These were then analyzed to determine those adjectives, if any, which differentiated significantly between the "highs" and "lows".

Findings:

In the college samples (N = 1253), the Hr scale correlated .38 with course grades. For the high school samples (N = 1108) the Nr scale correlated .36 with high school grades. "In these samples the mean correlation of Hr with measures of intellect was .26, and with indices of academic achievement was .38." In the medical school sample the general pattern of correlation with a number of assessment variables was uniformly favorable, and a significant correlation was obtained between the Hr and ratings of success in medical training.

The adjective patterning resulted in: "highs" described as "alert, clear-thinking, efficient, intelligent, pleasant and resourceful"; "lows" described as "dull, immature, rebellious, rigid, and wary."

Conclusions:

The Hr scale can be used to predict academic achievement and is not merely an indirect, inefficient, measure of intellect. Hr scores carry social psychological implications.

I-A-1

GROOMS, Robert R., and ENDLER, Norman S., "The Effect of Anxiety on Academic Achievement", J. Educ. Psychol., (1960), 51:299-304.

Purpose:

This study was designed to test the following hypotheses: (1) high anxious (HA) subjects obtain significantly lower aptitude scores than low anxious (LA) subjects, (2) HA subjects obtain higher grade point averages, (3) a significant negative correlation exists between anxiety test scores and achievement test scores, (4) a significant correlation exists between anxiety scores and GPA, and (5) multiple regression prediction equations including anxiety scores will yield a significantly more accurate prediction.

Subjects:

The subjects for the study were 91 male students enrolled in Introductory Psychology at Pennsylvania State University. Their ages ranged from 18 to 32 and most were sophomores or juniors.

Procedure:

All subjects were administered the Mandler-Sarason (TAQ) and the Generalized Anxiety Questionnaire (GAQ). Scores on the Pennsylvania State University Academic Aptitude Examination (PSAE) and each student's predicted grade average (PGPA) were obtained from school records. Each student's grade point average was obtained for that semester and cumulative. On the basis of TAQ scores, the subjects were divided into three groups - high anxiety (HA), medium anxiety (MA) and low anxiety (LA).

Findings:

(1) There was no significant difference in the means of the achievement and aptitude measure for the HA and LA groups.
(2) A significant negative correlation (p .01) was found between anxiety and PSAE.
(3) No significant correlation was found between anxiety test and achievement measure (GPA).
(4) Adding TAQ scores to the multiple regression equation for predicting grades did not change the prediction ability of the equation. However, when the prediction equation was applied to the groups separately the correlation of .30 was raised to .63 for the HA group and lowered to .13 and .19 for the MA and LA groups.

Conclusions:

(1) HA subjects do not differ significantly from LA subjects on aptitude or achievement measures used in this study.
(2) There is a significant negative correlation between test anxiety scores and the measure of aptitude.
(3) There is no direct significant relationship between test anxiety relationship.
(4) Test anxiety serves as a modifier variable which enhances the prediction of grade averages from aptitude test scores for high anxiety students.

I-A-1

**HACKETT, H. R.**, "Use of the MMPI to Predict College Achievement", J. Counsel. Psychol., (1955), 2:68-69.

Purpose:

Assuming that factors other than ability factors are of importance in determining achievement, this study was undertaken to test the hypothesis that scores on various MMPI scales are related to academic achievement in college.

Subjects:

Thirty-two North Dakota Agricultural College freshman men entering school the spring quarter of 1954 served as subjects for this study.

Criterion:

College achievement was measured by the grades received at the end of the entering quarter.

Procedure:

Pearson Product-moment correlations were computed between each MMPI scale score and the quarter's grade point index and between the ACE scores and the grade point index. Then, for the correlations which appeared to be ... "high enough to justify it ...", the ratios were computed.

To test the possibility that the MMPI scores were ability influenced, correlations between the ACE and the MMPI scores were computed.

Findings:

Correlated with grades at better than one percent confidence level, were the ACE (t = 5.21) the Pd (t = 4.91), and the Ma (t = 3.92) scores, and at better than five percent confidence level, were the K (t = 2.16) and the Hs (t = 2.38) scores.

The K and the Pd scores correlated closely with ACE scores (.48 and -.67 respectively). The Hs and the Ma scores correlated slightly with ACE scores (-.09 and + .15 respectively).

A multiple correlation of .97 was computed for grades, Ma and ACE - possibility unduly influenced by the high correlation (.84), between grades and ACE score.

Conclusions:

Of four MMPI scales (K, Pd, Hs, Ma) found to be valid academic achievement predictors, two scales (Hs and Ma) appeared to measure factors different from the ability factors measured by the ACE. Combining the Ma and the ACE scores in a prediction equation improved prediction efficiency.

"The number of negative correlation between grades and MMPI scores would tend to substantiate the assumption that good adjustment is important to college achievement."

HACKETT, H. R., "Use of MMPI Items to Predict College Achievement", Personnel and Guid. J., (1960), 39:215-217.

Problem:

(1) That items exist in the MMPI which are answered differently by high and low achievers.

(2) That such items could be combined to form a scale which would yield meaningful predictions of achievement.

(3) That such items could be grouped in such a manner as to warrant the forming of some hypothesis about the personality structure of low and high achievers.

Procedure and Results:

The initial data consisted of the MMPI records of 32 male, beginning freshmen (the entire entering class in a spring quarter). At the end of the spring quarter, grade point averages were computed for each subject and the group was ranked according to their achievement. The upper quartile (N = 8) was designated high achieving and the lower quartile, low achieving. Responses for each item in the MMPI were tabulated for each group to find items which discriminated the upper from the lower groups. The difference between the groups being 3, to determine which items discriminated.

Seventy-two items were selected and combined into an achievement scale. Scoring keys were prepared for the achievement scale and the entire group's MMPI results were scored for this new variable.

At the beginning of the fall quarter, the entire male entering freshman group (N = 545) took the MMPI experimental achievement scale. The Pearson product-moment r between the Z (achievement) scale score and GPA was .61.

This indicated a predictive efficiency superior to that of an abiltiy test, r, between grades and ACE scores being .39. The correlation between ACE scores and Z scale scores was .1, indicating that a factor other than ability was being measured. A multiple r between Z scale-ACE and grades was a high .69. It was definitely indicated that this new grouping of items was identifying some factors or factor related to obtaining of college grades.

Summary:

(1) High and low achieving male students tend to make different self reports about themselves on a questionnaire such as the MMPI.

(2) Such self reports can be used to predict future academic achievement of male students.

(3) There were many similarities between the low achieving group and the "authoritarian personality".

HARRALL, Bernice M., "Academic Performance and Personality Adjustments of Highly Intelligent College Students", Genetic Psychol. Monogr., (1957), 55:3-83.

Purpose:

To determine the relationship between academic performance and personality adjustments of highly intelligent college students.

Method:

An experimental group was composed of freshmen who entered Purdue University in September, 1947, and who were between the 94th and 100th percentile inclusive on the American Council on Education Psychological Examination for college freshmen (1.5 sigma and above). A control group was selected from the 43rd to the 58th percentile inclusive on the same examination (-.2 sigma to + .2 sigma). The 94 experimental subjects were matched with the 94 control subjects in: school at the university, sex, veteran status, and fraternity membership.

The experimental group was 1.24 grade points above the control group in grades at the end of the 1st semester, but only .43 grade points above the control group at the end of the eighth semester.

According to the accomplishment index, calculated by subtracting the ACE sigma scores from the grades in sigma values, the experimental subjects achieved academically at a lower level than expectancy (-.82 sigma), whereas the control subjects achieved academically at about their appropriate level (-.10 sigma).

Results:

1. On the Clark Group Thematic Apperception Test, the experimental subjects were significantly better off than the control subjects in the following:

Fewer total needs, fewer needs for achievement and recognition, better overall adjustment, better effect of environment on organism, and better reaction of organism to environment.

2. On the Spencer Experience Appraisal, the experimental subjects were significantly better off than the control subjects in the following:

Fewer conflicts about personal characteristics and about school performance.

3. No significant differences in mean number of checks was found for a selected group of 51 experimental subjects and 51 matching control subjects on the Group Rorschach Records analyzed by the Munroe Inspection technique.

Both experimental and control groups showed a marked introversive personality pattern and neurotic (color) shock was present in 89% of the total selected group of 102 subjects.

4. Experimental and control subjects were considered to be high achievers if their semester 2 grades were at or above three-fourths sigma above the means of their respective groups (experimental or control). Experimental and control subjects were considered to be low achievers if their semester 2 grades were at or below three-fourths sigma below the means of their respective groups.

5. The low-achieving experimental subjects when compared with the high-achieving experimental subjects, showed significant differences as follows:

> On the TAT, poorer overall adjustment, a poorer "reaction of organism to environment", and a less satisfactory "ending"; on the Experience Appraisal, more conflicts in general and in the specific areas of fathers' behavior, personal achievement, health and school performance; on the Rorschach, poorer form perception.
>
> The high-achieving control subjects showed the following significant differences when compared with the low-achieving control subject:
>
> A poorer description of fathers on the Experience Appraisal; on the Rorschach, more resistiveness, more free floating anxiety, less controlled emotional anxiety, less controlled emotional responsiveness, marked lack of emotional responsiveness and introversiveness reading pathological proportions. The low-achieving control subjects shows more immature reaching out for contact experience.

6. The high-achieving experimental subjects showed the best overall adjustment of all sub-groups, and when compared with the high-achieving control subjects were significantly better off in:

> Total adjustment on the TAT and "reaction or organism to environment"; on the Experience Appraisal, less conflict about mothers' behavior and own school performance; on the Rorschach, less deep underlying anxiety, more outer control and more mature affect.

7. The high-achieving experimental subjects were significantly better off than their matching controls as follows:

> Better overall adjustments on the TAT, less need for affection, better effect of environment or organism; less conflicts about mothers' behavior, personal achievements and characteristics, and about school performance.

8. The low-achieving experimental subjects were significantly worse off than their matching controls by having more conflicts about parent-child relationships and about their own health.

9. The high-achieving control subjects when compared with their matching experimentals, gave a significantly poorer description of their fathers, but showed less conflict about fathers' behavior.

10. The low-achieving control subjects showed a significantly poorer overall adjustment on the TAT when compared with their matching experimental subjects.

Summary:

In order of excellence of adjustment, it seems apparent in this study that sub-groups are arranged as follows:

1. Excellent adjustment: high-achieving brilliant students.
2. Fair adjustment: low-achieving students of average ability.
3. Poor adjustment: high-achieving students of average ability.
4. Very poor adjustment: low-achieving brilliant students.

I-A-1 also I-A-4

HOLLAND, John L., "Prediction of College Grades from Personality and Aptitude Variables", J. Educ. Psychol., (1960), 51:245-254.

Purpose:

This study was designed to explore the usefulness of non-intellectual factors in predicting college grades and to provide information for a theory of academic achievement.

Subjects:

The sample for the study consisted of 611 boys and 311 girls selected from the finalists in the National Merit Scholarship competition. The students attended 277 colleges.

Procedure:

The Sixteen Personality Factor Questionnaire (16PF), The National Merit Student Survey (NMSS), and Vocational Preference Inventory (VPI) were administered to the student sample about three months before the beginning of the college term. Scholastic Aptitude Test (SAT) scores and high school rank (HSR) were also obtained.

College grades were correlated (product-moment) with the 16PF, NMSS, VPI, HSR, and SAT variables for student samples that had been classified four ways: (1) correlations were made for total male and female samples, (2) colleges attended were dichotomized using the Talen Supply Index (TSI), and correlations were obtained for samples of students attending low and high talent supply colleges, (3) male and female students were classified by means of the PhD, productivity indices of colleges attended and correlations were computed for student samples of colleges falling above and below and median; and (4) correlations were made between grades and predictors for the two institutions with the largest sample.

Findings:

(1) Correlations based on the TSR groupings indicate that the successful male achiever was high in scholastic aptitude and ranked high in his high school graduating class. He is characterized as dependent, serious, persistent, responsible, submissive, quiet, feminine, naive, self-sufficient and self-controlled. The female achiever is characterized as persistent, responsible, submissive and conservative.

(2) High school rank is consistently superior as a predictor of college grades. HSR is a function of high academic aptitude, academic personality syndrome (males - serious, feminine, and conservative; girls - submissive, self-controlled, self-depreciation, intellectuality and self-sufficiency, and has a positive relationship with her teachers).

(3) Using samples based on PhD production, the following characteristics of achievers were revealed: for boys - dependence, extroversion, intollerance for ambiguity, submissiveness, conventionality, confidence, conservatism and self-control.

(4) For Harvard students the achievers were classified as unstable, feminine, naive, anxious and emotional. At MIT the achiever is characterized by superego and persistence.

Conclusions:

(1) The most effective non-intellectual predictors are superego, persistence and play.

(2) The most effective predictor of college success is high school rank.

Discussion:

The author discusses the relationship between characteristics of academic achievers and the characteristics of creative individuals. He compares Cattel's description of the creative individual based on the 16PF and the characteristics of the academic achiever as reaveled by the 16PF. The comparison reveals quite different personality traits indicating that the academic achiever has less potential for creativity than the non-academic individual. This implies that high school and college grades are not necessarily good predictors of college success.

I-A-1

HOYT, D. P., and NORMAN, W. T., "Adjustment and Academic Predictability", J. Counsel. Psychol., (1954), 1:96-99.

Purpose:

To test the hypothesis that academic ability tests will predict grades less well for a maladjusted population than for a well-adjusted population.

Subjects:

Three groups composed of freshmen at the University of Minnesota were constructed in the fall of 1951-52 and 1952-53. (1) Maladjusted group - those students who had a T score of 70 or above on two or more of the clinical keys of the MMPI (excluding Mf). (2) One peak group - those students who had only one T score above 70 (excluding Mf). (3) Normal group - those students who had no T scores of the MMPI above 60.

The assumption was that a measure of the degree of disturbance is provided by the height of the profile.

Procedure:

Correlations between first quarter grades and two aptitude tests were computed for each of the groups for the years listed above. The aptitude tests used were the Ohio State Psychology Examination and the 1947 edition of the ACE Psychology Examination.

Results:

OHIO results: The correlations (r) were markedly higher for the normal group than for the maladjusted, also the "one-peak" group which represented an intermediate degree of adjustment, had an "r" that fell between the extremes. The differences between normal and maladjusted groups were significant at the .05 level or better for the 1951 groups. The 1952 group's significance level is slightly higher.

ACE results: Not as consistent. "The r's using the ACE were not considered to be crucial in as much as this test was used for admission purposes." The differences were not significant at the .05 level.

Conclusions:

Using the Ohio as the measure of academic aptitude, the hypothesis that academic ability tests will predict grades less well for the maladjusted population than for a well-adjusted population seemed to be confirmed beyond reasonable doubt.

Discussion and Implications:

(1) The accuracy with which academic prognosis can be attained is a function of the adjustment of the individual (as defined by the MMPI).

(2) The question of "What personality dynamics disparate with ability, operate in achievement" still remains unanswered.

(3) Changes in the adjustment state of an individual should be associated with changes in academic achievement. "As maladjustment decreases, over and underachievement should tend toward normal achievement."

I-A-1

JENSEN, V. H., "Influence of Personality Traits on Academic Success", Personnel Guid. J., (1958), 36:282-284.

Purpose:

In an attempt to gain a better understanding of the influence exercised by personality traits over nonachievement and low scholastic ability, this study was designed to statistically compare nonachieving, low scholastic ability students with achieving, low; achieving, high; and nonachieving, high scholastic ability students. The specific hypothesis dealt with was that low scholastic ability students, as compared to other groups of students, are at a disadvantage in the nonintellectual college life areas.

Subjects:

Four hundred and fifty-eight of the freshman class entering Brigham Young University in the fall of 1955 were selected as the subjects for this study.

Procedure:

On the basis of scholastic ability (predicted college grade-point average as determined from ACE scores and high school grade-point averages) and scholastic success (actual grade-point average for a minimum of thirty credit hours) the following groups were established.

| | | | grade point average | |
|---|---|---|---|---|
| | group | N | predicted | actual |
| nonachieving, low scholastic ability | A | 146 | below 2.27* | below 1.75 |
| achieving, low scholastic ability | B | 107 | below 2.27 | above 2.24 |
| achieving, high scholastic ability | C | 147 | above 2.93** | above 2.25 |
| nonachieving, high scholastic ability | D | 58 | above 2.93 | below 1.75 |

* lower 27% of the total class distribution
** upper 27% of the total class distribution

Subjects had taken the shortened MMPI (366 items) at the time of entering Brigham Young University. "Only L and F scores were selected from the three validity scales, as the scores on the '?' scale were within the normal range in all cases." The statistical analysis consisted of making comparisons of mean scores among the various traits on the MMPI. The t-ration was employed to test the significance of the difference among the means.

Findings:

Group A had significantly higher mean scores than Group B on scales F, Sc and Ma. Group B never scored higher than Group A. Group A tended to score higher than Group C on all scales except Mf (the only scale on which only males were compared) where Group C males had a significantly higher mean score than Group A males. Significantly higher mean scores were obtained by Group A on scales F, Hs, Pd, Pt, Sc and Ma. Compared with Group D, A scored significantly higher on the F, Pd, Pt, Sc and Ma scales. Group D did not score significantly higher than Group A on any one scale.

I-A-1 also I-A-2

JENSEN, W. R., "Anxiety, n-Achievement, Aptitude and Prior Knowledge as Predictors of College Achievement", Ed. D. Dissertation, University of Nebraska, 1961.

Purpose:

The purpose of this investigation was to investigate the extent to which certain personality variables contribute to an explanation of the variation in college grades. Specifically, the purposes of the investigation were: (1) "To determine the proportion of the variance in college achievement grades associated with anxiety, need-achievement, aptitude and prior knowledge as measured by the instruments; (2) To provide a comparison of these proportions of variance between sexes and between certain college courses; (3) To determine the contribution of certain measures of personality variables to currently used measures for predicting achievement."

Method:

The criterion used in this study was college achievement. This restrictive definition was used to reduce the influence of extraneous variables.

Instruments used in this study: Taylor Manifest Anxiety Scale; this is essentially the general drive of an individual. McClelland's Thematic Apperception Measure of n-Achievement; this is essentially designed to measure the need to achieve. It is a method of content analysis of imaginative thought sequences. Aptitude was measured by the "L" score of the ACE Psychological Examination. "Prior Knowledge" is the knowledge of the subject matter of a course as measured by some relevant test prior to the completion of the course. Achievement is knowledge of the subject matter obtained in the course and measured by the final test on the final grade.

Procedure:

The short form of the MAS was used in this investigation. The form known as set A of the "n-Achievement" was given. The scoring on this test was from -1 (no achievement imagery) to +1 (achievement imagery).

Four stimuli pictures were used. The scoring technique required that the scorer determine whether certain aspects of the behavior and experiences of the characters in the stories were present or not. The highest possible score for a single story was twelve while the lowest was -1. A subject's four story score then could range from 48 to -4.

The L part of the ACE Psychological Examination was given for aptitude (prediction of college success). The scores used in the study were stanine scores based upon a 1952 norm group at the University of Nebraska.

Two measures of prior knowledge were employed. One was a pretest for Educational Psychology, English, History, and Sociology. Two-hundred-thirty-nine students in Educational Psychology were given a pretest by their respective instructors at the start of the first semester of the 1960-61 school year.

The programs of the 190 students for whom all scores (of the above tests) were available were checked so as to locate other courses in which large numbers of the same students were enrolled. History, English, and Sociology were then included. A measure of prior knowledge was available for the subjects who were enrolled in the English course. The data for 149 female students and 44 male students were analyzed separately as the literature revealed a differential effect between sexes for certain of the variables.

Results:

1. "The MAS had a significant correlation with achievement for male subjects but the correlations with female and mixed sex groups were not significant. The elimination of the Taylor MAS from the multiple regression formula was not a significant loss for male, female or mixed sex groups.
2. The n-Achievement variable failed to correlate significantly with any of the variables and its contribution in the explanation of variation in achievement was minimal.
3. A combination of the MAS and n-Achievement did not make a significant contribution to the prediction of achievement when added to measures of aptitude and prior knowledge.
4. The value of the MAS or the n-Achievement did not vary to any great extent from course to course except for the value of the Taylor MAS for male subjects.
5. Approximately 60% of the variance in achievement scores still remains unaccounted for when all of the variables were measured by the methods employed in this study."

I-A-1

KLUGH, Henry E., and BENDIG, A. W., "The Manifest Anxiety and ACE Scales and College Achievement", J. Consult. Psychol., (1955), 19, 6:487.

Purpose:

This study was intended to add additional evidence to the studies reported by Matarazzo, et al. and Schultz and Calvin, by administering the MAS and Geugh's Hr scale and correlating these tests with QPA (quality point average).

Setting:

Subjects: One hundred and eighty-four men and women enrolled in Introductory Psychology at the University of Pittsburgh during the 1954 fall semester served as subjects in this study.

Criteria: The criterion for this study was the subjects' QPA.

Procedure:

Four variables were used: ACE, MAS, Hr, and QPA. "Raw scores on the three tests were converted to Stanines on the basis of previous norm groups, and Pearsonian correlations on the pairs of variables were computed. In addition, multiple correlations on the test variables and the QPA criterion were obtained."

Findings:

Interest correlations were:

| | | |
|---|---|---|
| ACE and MAS | -.11 | not significant |
| ACE and Hr | .29 | significant at .01 level |
| Hr and MAS | -.29 | significant at .01 level |

Correlations of each test with criterion were:

| | | |
|---|---|---|
| Hr and QPA | .32 | significant at .01 level |
| ACE and QPA | .62 | significant at .01 level |
| MAS and QPA | .01 | ? |

From single and multiple order correlation comparisons, the author indicated that ACE combined with Hr scales predicted QPA better than ACE alone (.05 level), that the addition of MAS to either ACE or to Hr scales does not improve QPA prediction, and that the total combination of MAS, ACE and Hr scales did increase the QPA multiple correlation significantly (.05 level).

Conclusions:

The MAS-ACE correlations fell about midway between the Matarazzo, et al. and the Schulz and Calvin report correlations.

Since the Hr scale is untimed, the significant negative correlation between the Hr and the MAS failed to substantiate the hypothesis (from Matarazzo, et al. article that the MAS correlates negatively with timed tests and zero with untimed tests.

The validity of a battery consisting of ACE and Hr tests, tends to be increased by the addition of the MAS. The authors offer as possible explanation for this: the MAS acts "as a weak suppressor variable for the QPA - irrelevant variance in both the ACE and Hr predictors."

1-A-1

KRUG, R. E., "Over and Underachievement and the Edwards Personal Preference Schedule", J. Applied Psychol., (1959), 43, 2:133-136.

Purpose:

Gebhart and Hoyt (1958) have presented data showing that several scales of the Edwards Personal Preference Schedule (EPPS) discriminate between over and underachievers. The author in an unpublished study of apparent identical design found no significant differences. There is one difference in procedure in the two studies. Discrimination between under and overachievers in the author's study was on the basis of three achievement tests and high school standing, hence post-performance was the criterion. The Gebhart and Hoyt study discriminated on the basis of aptitude measures which define expected future performance. The present study was designed to replicate the Gebhart and Hoyt study and to test the difference between aptitude-based and performance-based determinations of expected performance.

Procedure:

The samples were drawn from the 411 freshmen entering the College of Engineering and Science at the Carnegie Institute of Technology in September, 1956. Two predictions of grade average were made on each student...the performance-based prediction employing the three achievement tests and high school standing and the aptitude-based prediction using the verbal and math scores from the College Board Scholastic Aptitude Test. Treating each set of predictions separately, students were catagorized as low, average, or high predicted. A student was assigned to the overachiever group if his first year grade average was above the predicted score and visa-versa if below the predicted score. A student thus might be an overachiever on the basis of one predictor and an underachiever on the basis of the other.

The performance-based sample was constructed by selecting from each of six groups (two levels of achievement and three levels of predicted achievement), the 20 subjects whose obtained average was most discrepant from that predicted. The aptitude-based sample was chosen by an identical procedure. Seventy-three subjects were common to the two samples; a fact which reflects the positive relationship between the aptitude and achievement tests as predictors.

Scores for the 15 EPPS scales were collected for all subjects. This had been done during the freshman orientation period. An analysis of variance using a 2 x 3 factorial design was applied to each of the 15 scales in each of the two samples.

Results:

For the aptitude-based sample, the hypothesis of no difference between groups of over and underachievers was rejected for five scales. Overachievers in a College of Engineering scores significantly higher on scales of Achievement, Order, and Endurance; and significantly lower on scales of Affiliation, and Heterosexuality.

For the performance-based groups, the null hypothesis was rejected only for achievement on which overachievers were significantly higher.

Correlations between level of predicted ability and five of the EPPS scales were observed for the aptitude-bases sample. These scales were Deference, Order, Dominance, Abasement, and Heterosexuality. In addition, significant interaction between groups and levels were found for Deference, Succorance, and Endurance scales in the aptitude-based group.

Conclusions:

In regard to the objective of investigating the relationship between EPPS scale scores and over and underachievement in a College of Engineering:

1. Overachievers scored significantly higher on Achievement, Order and Endurance scales and significantly lower on Affiliation and Heterosexuality scales.

2. The scales are statistically independent within relevant samples, indicating that several patterns of over and underachievement are present. High ability subjects score significantly higher than low ability subjects on Dominance, Heterosexuality, and significantly lower on Deference, Order and Abasement.

3. Significant interactions between ability level and over and underachievement were present for Deference, Succorance, and Endurance scales.

Conclusions regarding second objective of examining two bases (aptitude vs. achievement tests) for predicting level of performance, the following conclusions were forwarded.

1. "When over and underachievement are taken as departure from a regression line based on achievement tests and high school records, only the Achievement scale of the EPPS discriminates between the two groups.

2. The variance which EPPS scores account for is the same variance that is explained by a subject's past record of ability performance differential.

3. Theories of over and underachievement may start with the personality description of subjects who deviate from an aptitude-based regression line.

4. For purposes of selection, the EPPS and certain evidences of past performance were functionally equivalent."

I-A-1

LANG, Gerhard, SFERRA, Amedeo G., and SEYMOUR, Marjorie, "Psychological Needs of College Freshmen and Their Academic Achievement", Personnel Guid. J., (1962), 41:359-360.

Purpose:

To relate the psychological needs of Farleigh Dickinson University freshmen as measured by the EPPS to their academic achievement, based on instructors' estimates.

Method:

The sample used in this study consisted of 38 male and 49 female college freshmen, 17-19 years of age, who entered Farleigh Dickinson University in the fall of 1959. Toward the end of the 1959-60 academic year, 81 instructors in the various disciplines were asked to rate, on a five-point scale, each student's academic achievement with respect to his estimated intellectual capacity. For each of the 87 subjects comprising the final sample, a median achievement rating was determined. The lower the rating, the greater was the degree of underachievement. Product-moment correlations were computed between these median achievement ratings and scores obtained on the 15 EPPS variables.

Results:

For female freshmen, academic achievement correlated positively with n-Achievement and dominance, negatively with n-Nurturance. On the other hand, in the case of male freshmen, academic achievement correlates positively with n-Order, negatively with n-Dominance. All of these reported correlations were significant at the .05 level or better.

Conclusions and Implications:

Certain EPPS variables differentiate significantly between low and high achieving male and female freshmen. In view of the limited sampling upon which these findings are based, it appears most desirable that investigations of this type be replicated at other institutions. Thus, it is conceivable that the EPPS complementing other non-intellectual measures, may be employed to identify potential underachievers early in their freshman year.

I-A-1

LYNN, R., "Two Personality Characteristics Related to Academic Achievement", British J. Educ. Psychol., (1959), 29:213-216.

Purpose:

The present paper is concerned with two predictions from behavior theory to the problem of individual personality differences in capacity for academic work. Experimental studies suggest that capacity for sustained work depends largely on an individual's level of drive and accumulation and slow dissipation of reactive inhibition. If Eysenck's theory is accepted, good educational attainers should (1) score high on neuroticism and (2) low on extraversion.

Method:

Levels of neuroticism and extraversion were assessed in university freshmen and in control subjects by means of the Maudsley Personality Inventory. Control subjects involved were (a) 67 female occupational therapy subjects of the same age and social background as the female university subjects but differing in academic motivation, (b) 100 male apprentices, aged 16 through 19, whose scores on neuroticism and extraversion were taken from a previous study. The norms of the questionnaire were also used as a control, although they are probably less satisfactory because there may be some tendency for different age groups to score differently.

Results and Discussion:

All the differences were in the predicted directions and were significant at the .05 level, as tested by the calculation of the standard errors of the differences between the means.

The results support the two predictions at a significant level and extend the findings of Furneaux and Broadbent.

It may be thought that the positive association of academic attainment with neuroticism presents a curious contrast with the results of laboratory experiments, in which it is generally found that high drive levels impair the learning and performance in stress situations but a facilitating one in so far as it motivates sustained work.

I-A-1

McDANIEL Ernest D., HALTER, Alpert N., and HARTFORD, Donald L., "Grade Utility: A New Noncognitive Factor in Academic Prediction", Educ. Psychol. Measmt., (1961), 21:621-627.

Purpose:

This was an exploratory study in an attempt to relate the concept of utility as developed in the theory of games to the problem of prediction of academic achievement.

Method:

Using responses to a questionnaire on which a student may express his preference for obtaining a certain grade or gambling for a higher grade at given levels of risk, utility values and marginal utility, values for letter grades, C, B, and A were computed for 104 college students. These indices were related to first semester grade point averages, controlling for academic ability.

Results:

The correlation coefficient between the College Qualification tests total score and first semester grade point averages were .68. A multiple correlation coefficient obtained from a linear regression of first semester grade point average upon CQT total score and the eight utility values generated from the responses was .718. Multiple R obtained from a linear regression of grade point average upon CQT total score and the three marginal utility values was .689. Analysis of covariance between grouped profiles with grade point averages adjusted for differences in ability yielded a non-significant F.

Conclusion:

The results indicated that the utility values may be more useful than the marginal utilities or a combination of these two measures in predicting early academic achievement. This approach appears to have a number of possibilities, and it may be hoped that refinements in procedure and analysis will eventually produce a useful research tool.

I-A-1

MITCHELL, J. V., "An Analysis of the Factorial Dimensions of the Achievement Motivation Construct", J. Educ. Psychol., (1961), 52:179-181.

Purpose:

This study was designed to evaluate various measures of achievement motivation and to make a careful analysis of their correlates and factorial dimensions. It was hoped that such a procedure would shed light on whether achievement motivation is a unitary construct or whether it refers to several psychological dimensions.

Subjects:

The subjects were 131 female college students enrolled in a teacher training course.

Procedure:

The following instruments and measures were used in the analysis: (1) The McClellend Test of Achievement Motivation, (2) a sentence completion test of achievement motivation, (3) an adjective check list containing achievement related items on which the subjects rated themselves, (4) an inventory type test of achievement motivation, (5) a multiple choice questionnaire which included achievement motivation items, (6) the Taylor Manifest Anxiety Scale, (7) a level of aspiration measure (subjects were asked what grade they could reasonably hope to attain on an examination in an educational psychology course they were taking) and (8) a measure of discrepancy between achievement and potentiality (ACE standard scores were subtracted from GPA standard scores).

The analysis was divided into two parts. First the scores from the various instruments were correlated with one another and with grade point average criterion. Finally, all of the individual items comprising the various instruments were intercorrelated and subjected to a centroid factor analysis and subsequently rotated to orthogonal simple structure by means of Kaiser's varimax technique.

Findings:

(1) The simple adjective checklist was the best predictor of the criterion (GPA-ACE).
(2) The achievement motivation inventory was significantly related to the criterion and also had a significant negative correlation with ACE.
(3) The level of aspiration measure was significantly related to the criterion.
(4) The Taylor Manifest Anxiety Scale, the McClelland Test and the sentence completion test were not related to the criterion.
(5) Several factors were tentatively identified. They were: (a) academic motivation and efficiency - involving the actual effort expended to do an effective academic job, (b) self-satisfaction - involving self-satisfaction with achievement, (c) wish fulfillment motivation - representing a strong desire but little application or fulfillment, (d) nonacademic achievement motivation - referring to a generally positive achievement orientation but not including academic achievement, (3) external

pressure to achieve - referring to a feeling of parental pressure to do good academic work, (f) imputed generalized motivation without attendant effort - referring to willingness to try hard in tasks undertaken.

**Conclusions:**

The concept of achievement motivation refers not to a unitary construct but to several different psychological dimensions, each with different implications and different empirical correlates.

I-A-1

MORGAN, H. H., "A Psychometric Comparison of Achieving and Nonachieving College Students of High Ability", J. Counsel. Psychol., (1952), 16:292-298.

Purpose:

To evaluate interests, personality traits and motives of achieving and nonachieving college students of high ability, and to investigate the relationships between these measured personality variables and scholastic success.

Method:

A group of male sophomore students of high scholastic aptitude was selected from the College of Science, Literature, and the Arts, of the University of Minnesota (SLA). These students, chosen on the basis of high scores on the ACE, were divided into groups according to honor point ratio earned during their freshman year in college. One group contained students who earned more than a B average during their freshman year; another contained students who earned grades below the average of all SLA freshmen. These groups were designated achievers and nonachievers, respectively.

Psychometric comparisons of achievers and nonachievers were made on the Strong Vocational Interest Blank, the MMPI and the Thematic Apperception Test (TAT) and a series of semi-structured tests.

Results:

Achievers and nonachievers did not differ significantly in variety of well-developed interests as manifested in interest patterns on the Strong Blank. However, achievers and nonachievers were found to differ significantly in social service or welfare occupations. Significantly more achievers than nonachievers had interests in the previous category. More nonachievers than achievers had interests typical of persons in business detail occupations and business sales occupations. On Strong's Blank, achievers scored significantly higher than nonachievers on a scale of Interest Maturity (IM). Achievers and nonachievers did not differ significantly from each other in Occupational Level scores or in femininity of interests.

Achievers scored higher than nonachievers on an MMPI scale of Dominance. Achievers also scored higher than nonachievers on a scale of Social Responsibility. Achievers scored higher than nonachievers on a scale of Intellectual Efficiency. A number of other special scales, including some designed to predict academic achievement, did not yield significant differences between the two groups. Analysis of the MMPI indicated that more nonachievers than achievers had profile evaluations on the psychopathic deviate scale and profile low-points on the scale of paranoia.

For the most part, the MMPI clinical scales, considered either individually or as a profile pattern, did not show a clear relationship to scholastic achievement. Achievers were found to score significantly higher than nonachievers in achievement motivation.

**Summary:**

Several nonintellectual factors appeared to be related positively to academic achievement for college students: (1) maturity and seriousness of interests, (2) awareness of, and concern for other persons, (3) a sense of responsibility, (4) dominance, persuasiveness, and self-confidence, and (5) motivation to achieve, or need for achievement.

I-A-1

OSBURNE, R. T., and SANDERS, W. B., "Multiple-Choice Rorschach Responses of College Achievers and Nonachievers", *Educ. Psychol. Measmt.*, (1949), 9:685-691.

Purpose:

The purpose of the study was to evaluate the Harrower Multiple Choice Rorschach Test as an aid in differentiating between achievers and nonachievers at the University of Georgia.

Subjects:

Subjects for the study were two groups of Georgia University students. Nonachievers were 158 students who were placed on academic probation at the end of Winter Quarter, 1948. Achievers were a group of 93 students selected from Psychology classes in 1947-48 who had never been on academic probation. The groups were not matched on intelligence, educational experience or age, but were at the same level in college.

Procedure:

The basic assumption of the Harrower Multiple Choice Rorschach Test was that individuals most likely to give certain responses when responding freely in the Rorschach method would select such responses when confronted with a multiple choice situation. The form of the test used here was composed of 300 possible responses divided into three groups of 10 each for each of the 10 Rorschach plates. Weights or scores are assigned to each of the ten responses according to the scale of values given in Harrower-Steiner (1945). It was suggested that responses numbered 1 to 5 be called good and 6 to 10 poor. Mean weighted scores of achievers and nonachievers were compared for each Rorschach plate.

Results:

All differences favored the achievers. The nonachiever group tends to choose responses in the direction of poor or heavily weighted items. The average ratio of good to poor responses was below the Harrower cutting point for only one of the response groups for the achievers while the average ratio fell below the cut off in eight of the thirty groups for nonachievers.

A modification of the Harrower critical scores was deemed necessary. So critical scores or points of over topping of the two curves were obtained for each of the response groups. In this a variable cutting point was established for each group of weighted responses. In some cases the new cutting point corresponded with Harrower's cutting ratio; in others it didn't. Rather than call the responses good and poor, the author decided to call these responses below the critical score "probation signs" and those above "non-probation signs." Using the probation signs that appeared most predictive it was found that 77% of the two groups could be correctly placed using at least six of them. Seventy-eight of the nonachievers and 75% of the achievers were assigned by this method.

Another approach to the problem was item analysis of the 300 items. The percentage of students choosing each of the items was compared. Fourteen responses were chosen more often by nonachievers and 17 more often by achievers. Some plates elicit more probation responses than others. Approximately the same percentage of achievers and nonachievers were correctly placed by this method as by the Harrower cut-off method.

Conclusions:

A comparison of the two groups showed statistically significant differences in 24 of the 30 response groups of the test. In 29 of the 30, the differences favored the achiever groups. In 22 of the 30, the differences were significant at the 1% level; in two others, they were significant at the 5% level.

The results are not very conclusive but the authors gave some Rorschach interpretation. Nonachievers as a group tend to show more signs of dysphoria and anxiety, oppositional tendencies are more frequent in the nonachiever group and color shock as manifested by deviation in form and content was present in nonachievers. This was sometimes interpreted to indicate inefficient use of mental capacities or the presence of emotional disturbances without intellectual control.

Achievers as a group showed greater control on the intellectual level (F+), more humor movement responses, more maturity and adjustment in emotional areas, and good combinatory wholes. This is frequently interpreted to mean a presence of abstract and theoretical intelligence.

I-A-1

RED, S. B., McCARY, J. L., and JOHNSON, Bette, "A Study of the Relationship Between Aspirational Levels and Academic Achievement", J. Educ. Res., (1962), 55:159-163.

Purpose:

To determine the degree of relationship between some measures of aspiration derived from an adaptation of Cassell's Level of Aspiration Test and academic achievement.

Method:

Tests administered in this study were an adaptation of Cassell's Level of Aspiration Test, Otis Quick Scoring Mental Ability--Gamma and Revised Beta. There were 101 freshmen and sophomore students in the study. Scores on these tests and grade point averages were compared.

Results and Conclusions:

The highest correlation (+.62) was between freshman psychology grades and the Otis Test. The Otis correlated +.57 with grade point average. All correlation coefficients and comparisons between measures from the aspiration test and measures of academic achievement showed that little relationship was evident between the two. On the basis of these findings, it was concluded that the inclusion of this adaptation of Cassell's Level of Aspiration Test in a battery designed to predict academic achievement would not be economically advantageous.

I-A-1

RITCHEY, R. E., "The Relationship Between Academic Achievement and the Personality Variables Measured by the Edwards Personal Preference Schedule", M.A. Thesis, University of Nebraska, (1959).

Purpose:

To determine the relationship between shcolastic achievement and personality needs as measured by the Edwards Personal Preference Schedule.

Procedure:

Subjects were 179 women enrolled in an educational Psychology class at the University of Nebraska. Scores on the EPPS, the ACE-L scale, the English Classification Examination and course grades were obtained for each subject.

Each of the Edwards variables was correlated with course grades. For those variables that correlated significantly, an analysis of regression was obtained and the partial correlation computed with the ACE-L and English Test scores held constant. Comparison was made between a group scoring high on both the autonomy and Agression needs, and a group scoring high on both the deference and Endurance needs with respect to course grades, ACE-L scores and English Test scores.

Results:

Of the 15 variables, only two were found to be significantly related to grades at the 5% level. The intraception need was correlated .188 and the Abasement need was correlated -.155. Only the Abasement need yielded a significant partial correlation of -.158 with the criterion when academic ability was held constant.

I-A-1

ROOT, A. R., "College Achievement", J. Higher Educ., (1936), 7:387-388.

The article included material gathered at Hamline University for the prediction of academic success.

Student test scores, given prior to matriculation, were correlated with average marks made during the student's four years of college. These traits and the zero-order coefficients of correlation between each of them and college achievement were:

| | |
|---|---|
| Average H. S. marks or rank in school | .66 ± .01 |
| Scores on College Aptitude Test | .48 ± .02 |
| College-aptitude rank (CAT and HS rank) | .59 ± .02 |
| Scores on Otis General Intelligence Test | .52 ± .02 |
| Scores on Iowa English Training Test | .57 ± .02 |
| Marks in Freshman English | .71 ± .01 |
| Scores on the Neymann-Kohlstedt Diagnostic Test of Introversion-Extroversion | .31 ± .05 |
| Scores on Thurstone Personality Schedule (Psychoneurotic) | .03 ± .06 |

Findings:

Coefficients between the two personality or temperament tests indicated a low positive correlation between introversion and college achievement (a low negative correlation between extroversion and college achievement). Emotional stability or psychoneuroticism (measured by Thurstone Test) appeared unrelated to achievement.

The best single criterion for college success was the work made in freshman English. Prior to entrance the best single criterion is high school rank. A multiple-correlation (after freshman year) using high school rank, college-aptitude rank, Otis scores and marks in freshman English yielded a coefficient of .83. Prior to matriculation the test battery yields a correlation of .73.

It was suggested that "while a democratic society should offer opportunities to all its citizens, part of the expense of higher education should be borne by students according to their probabilities of success."

I-A-1

SANDERS, E. M., MEFFERD, R. B., and BROWN, O. H., "Verbal Quantitative Ability and Certain Personality and Metabolic Characteristics of Male College Students", Educ. Psychol. Measmt., (1960), 20:491-503.

Purpose:

This study examined certain personality, metabolic, and scholastic performance attributes of subjects who had large discrepancies between verbal and quantitative ability patterns as compared with subjects of approximately equal ability in the two areas.

Method:

Three categories based on the verbal and quantitative scores on the University of Texas Admission Test were studied - high verbal, low quantitative (Vq), the converse (vQ) and high verbal - high quantitative (VQ). There were 30, 25, and 29 subjects in each group, respectively, and the subjects were matched on both the high and low scores so that the discrepancy between abilities was the primary factor studied. The Edwards Personal Preference Schedule, McGuire Q check, and the Holtzman Ink Blot Test were used to gauge personality attributes, and 4 overnight urine samples covering known time intervals (overlapping the personality testing period of each subject) were analyzed for 31 constituents to assess physiological factors.

Results:

VQ subjects made high grades in all courses, Vq subjects made their best grades in verbal courses (although not as high as VQ) and the vQ subjects' grades were the converse. The scholastic performance of the groups was in close agreement with the scores on the English Placement and Reading Comprehension tests that were administered at the time of admission.

Although only the reaction time of the Holtzman Ink Blot test scores differentiates the groups at statistically significant levels, subjective estimates made after each test by the examiner correctly placed 60% of the subjects. In the EPPS, the Vq group scored significantly higher on the Autonomy scale than the VQ group. The VQ group scored significantly higher on the Dominance scale than the vQ group. The Vq group also scored significantly lower on the Endurance scale than either of the other groups.

In the McGuire Q check, members of the Vq group described themselves as having more personal orientation, as rejecting authority more strongly, and as being more ambivalent to members of the other two groups; the vQ subjects described themselves as being more dependent and as rejecting a reality orientation more than the other groups. Members of the VQ group expressed a reality orientation more than the Vq group and much more than the vQ group.

The Vq subjects had much lower urine flow and excretion rates for most variables than did the other two groups. Twenty-four of the 31 urinary constituents measured were lowest in this group while two of the phenolic acids were highest in it. When all the variables were considered in total, the VQ subjects diverged from those of both other groups with 42% of the variables.

Conclusions:

(1) Both the Vq and vQ groups were strikingly different from the VQ in many respects, including poorer scholastic performances (1st semester) in all types of courses attempted.

(2) There were significant different personality characteristics in the three groups, as measured by the Edwards and Q check tests.

(3) There were significant differences in the metabolic patterns of the three groups.

(4) The reaction time on the Holtzman Ink Blot Test differentiated significantly between the three groups as scored for 16 different categories.

At the present state of knowledge, it would be inappropriate to theorize about the mechanisms by which psysiological process, personality and verbal-quantitative abilities are related.

I-A-1

SARASON, I. G., "Test Anxiety and the Intellectual Performance of College Students", J. Educ. Psychol., (1961), 52:201-206.

Purpose:

This study was designed to investigate the relationship between certain intellectual and personality measures, hoping to find a significant relationship between certain personality factors and intellectual performance.

Subjects:

Subjects for the study were 326 male and 412 female students enrolled in introductory psychology and sociology at the University of Washington.

Procedure:

All subjects were administered the Autobiographical Survey (developed by Sarason) during regular class sessions. This test contains scales measuring test anxiety (TA), general anxiety (GA), lack of protection (LP), hostility (H), need for achievement (NA), and defensiveness (D). Thirteen measures of intellectual performance were obtained from the school records which were: (1) high school averages in English, Mathematics, Foreign Languages, Social Studies, Natural Science and electives, (2) Verbal and mechanical scores on the Guilford-Zimmerman Aptitude Survey, (3) Cooperative English Usage score, (4) Cooperative English spelling score, (5) Cooperative Mathematics I score, (6) Cooperative Social Studies II score, and ACE Q score. Correlations were then obtained between each personality variable and each intellectual measure.

Findings:

(1) For 11 of the 13 measures there was a significant negative correlation with TA, for NA there were 5 significant correlations and for GA there were 4 significant negative correlations (these figures are for males).

(2) For females TA correlated negatively and significantly with 11 of the 13 measures although the same variables were not significant for both males and females. H was controlled positively and significantly with 4 measures.

(3) When correlations were made between TA and the high school averages and entrance tests significant negative correlations for both males (p .01) and females (p .02).

Conclusions:

(1) There is a significant relationship between test anxiety and intellectual performance.

(2) This study confirms the results of previous study in which other personality measures were found to be unrelated to intellectual performance.

I-A-1

SEEGERS, J. E., JR., "A Further Investigation of an MMPI Scale for Predicting College Achievement", Personnel Guid. J., (1962), 41:251-253.

Purpose:

Using only female, upperclass students matched on IQ scores (three changes from Hackett's study), this study was undertaken in an attempt to validate Hackett's findings of a correlation between Z scale (MMPI) (discriminatory items) and grade point average.

Subjects:

The 34 total subjects were unmarried, female, University of Kentucky, full-time students who had enrolled for a minimum of three semesters.

Group I - 25 randomly selected from the dean's list.

Group II - probation students selected by individually matching, within three points, the Otis Gamma Quick Scoring Mental Ability IQ scores of Group I.

(Eight students were lost during the process for various reasons.)

Procedure:

The University testing service administered the MMPI and the Diagnostic Reading Test. For matched groups, T-score differences and a rank order correlation between IQ and Z scores were obtained.

Findings:

According to Hackett, it was expected that on the high achievement scale, the high achievers would answer "true" significantly more often than would the low achievers. However, a mean (based on the number of items answered "true") of 8.94 for the low achievers and a mean of 7.58 for the high achievers was obtained. Although within the range of chance, the direction of the findings agreed with Hackett's reported findings on the low achievement scale.

On the high achievement scale, the low achievement scale, and the two scales combined (the Z scale), no significant differences were found between the two groups.

A rank order correlation of .028 was computed for all 34 subjects and the Z scale.

Conclusions:

All findings were nonsignificant and were inconsistent with Hackett's reported findings except for obtaining a near zero correlation between IQ and Z scale scores. Thus, this study failed to validate the findings of Hackett.

I-A-1

SHAW, M. C., and BROWN, D. J., "Scholastic Underachievement of Bright College Students", Pers. Guid. J., September 1957 - May 1958, 36:195-199.

Purpose:

To discover some of the distinguishing characteristics of high ability students who have not achieved academically on a level commensurate with their ability.

Method:

Two groups with high ability on the ACE were obtained. One group was underachieving and the other group was in the upper quartile. T tests were used to indicate significant differences between the grade point averages of the two groups. The same test was applied to the mean ACE scores of the two groups. The groups were equated on the basis of age, length of time spent in school, and academic aptitude.

The criteria on which the two groups were compared included the following: The Cooperative Achievement tests, Form Y in the area of Math, Natural Science, Social Science, Cooperative English Test, and the Whipple Reading Test.

In the area of personality inventories, the Allport-Vernon-Lindzey Study of Values, the Bell Adjustment Inventory, and the Bell Preference Inventory were included. They were also compared on some social data.

Results:

No significant differences existed between the groups on the Cooperative Achievement tests and the Whipple Reading test. The two groups showed a significant difference with regard to the number of high school recommending units earned. More than twice as many underachievers as achievers carried a smaller than normal academic load. The differences between the two groups on the four categories of the Bell Adjustment Inventory were not significant in any case.

No differences between groups was found on the six scales of the Study of Values on the Economic and Social scales. The difference on the Social scale was more significant than the difference on the Economic scale. The former was significant at the 1% level while the latter was significant at between the 5 and 10% level. Family size and place of birth revealed no significant differences. Educational level of parents also revealed no differences.

Forty-seven percent of the underachievers indicated their present home to be in a town of less than 2,000 population. In the achiever group, only 17% indicated residence in towns this small. In addition, 50% of the achievers came from towns of over 10,000 while the corresponding percentage in the underachiever group was only 25.

Summary and Conclusions:

On the basis of no difference on standardized achievement tests, it seems clear that these underachieving students have absorbed as much general information from their schooling as elsewhere, as have their "achieving", intellectual peers. On the basis of the Social Scale, underachievers were characterized by an attitude of hostility or hypercriticalness with respect to people. With regard to the Economic Scale, it can be said that there is a tendency among the underachievers to feel that they have not had the material things that they would have liked from life when they were living with their parents.

I-A-1

SMITH, Josephine M., "The Prognostic Value of Entrance Tests in a Junior College", J. Educ. Psychol., (1941), 32:584-592.

Purpose:

The purpose of this study was to determine the value of various entrance tests in the prediction of academic success in public junior colleges. It was felt that due to the different entrance policies of junior colleges, entrance tests must subserve entirely different purposes in junior colleges than they do in other colleges.

Subjects:

The subjects were 296 junior college students who were divided into two groups - those attending college for one year and those attending college for two years. Each group was divided into two, the successes and the failures (those who failed to maintain a grade average of "C"). The following measures were obtained: (1) high school GPA, (2) Thurstone scores (ACE), (3) Bell Emotional Adjustment scores, and (4) the Iowa Reading test scores for comprehension and for rate. The mean score of each group on each test was then determined and a test of significance applied. Zero order correlations between grades and scores on the various measures were also determined. Various multiple correlations were also developed. Because of the different grading standards of various high schools, a special analysis was undertaken with subjects who graduated from one high school.

Results:

1. The mean scores of the successful one-year students were significantly higher than the mean score of the failures on the Thurstone, High School GPA and the Iowa Reading Test. There was no significant difference in the Bell Adjustment Inventory scores. The same relationship was found when the successful two-year students were compared with the one-year failures.

2. Correlations with college GPA, two-year students:

| | |
|---|---|
| Thurstone | .465 |
| High School GPA | .668 |
| Multiple r Thurstone - High School GPA | .704 |
| Partial r High School GPA (Thurstone k) | .593 |
| Partial r High School GPA (High School GPA k) | .290 |

3. Correlations with GPA for graduates of one high school

| | |
|---|---|
| High School GPA | .707 |
| Thurstone | .441 |
| Multiple r Thurstone - High School GPA | .732 |
| Partial r High School GPA (Thurstone k) | .648 |
| Partial r Thurstone (High School GPA k) | .261 |

Conclusions:

High School GPA differentiates most clearly between successful and failing students. The Thurstone (ACE Psychol. Exam.) differentiates fairly well, High School GPA is the best predictor of academic achievement.

I-A-1

**SORENSON, A. G.**, "Non-Intellective Factors Related to Success in College", Unpublished Ph.D. Dissertation, (1950), University of Utah.

Purpose:

To discover some of the non-intellective determinants of scholastic achievement among freshmen at the University of Utah.

Procedure:

Subjects consisted of approximately 1600 students who entered the University for the first time in the fall quarter of 1948. Scores for each subject were found on the MMPI, the Strong Vocational Interest Blank, the ACE Psychological Examination, the Cooperative Achievement English Test, the Mooney Problem Check List, the Biographical Inventory, and the Sentence Completion Test.

Four samples of subjects were examined. A group of 194 "bright passing" men were those who ranked in the upper quarter on ACE or in upper quarter on grade point average predicted from Cooperative Achievement Test, English and Mathematics scores and whose actual grade point average was 1.0 or more of possible 3.0 for the first quarter of college.

A representative group of women students was selected by taking every fourth woman on the Registrar's list of entering freshmen. They were compared with a representative sample of men students selected in the same manner. Statistical analysis consisted of Pearson Product-moment correlations and critical ratios.

Results:

With respect to comparison of men and women, the women who entered college were a more select group. They had higher high school GPA, they scored higher on the Cooperative Achievement Test, and a higher percentage made a 1.0 or higher college GPA the first quarter.

The high performance was not attributable to superior intelligence. Men showed a greater range of intelligence on the ACE and men's average score was significantly higher. Hence, women were more predictable with respect to scholastic achievement. The sexes responded quite differently to the Biographical Inventory and Problem Check List. Women reported closer associations with each other and parents described their childhood as happier, their emotional state as moody, themselves as having more physical ailments, and themselves as somewhat "bookish." Men reported themselves as having less problems in areas of future, finances, curricular, and teaching activities. Both groups reported most problems in adjustment to college work, with social and recreational activities second in frequency, and courtship, marriage and home and family last.

Bright passing and bright failing men showed differences on the Biographical Inventory also. Bright passing men report less friction between themselves and their fathers, as being better socially adjusted during high school but beginning dating at a later age. Passing men report their emotional state as up and down, but with less inferiority and guilt feelings. Passing men had more interest in English, reported greater participation in high school extracurricular activities, and greater conformity regarding smoking, drinking, marriage and sex and church attendance.

On the MMPI, bright passing men scored slightly higher on the K, L, Hs, Hy, Mf, and Pt scales. Mean scores on the F, D, Pd, Pa, Sc, and Ma were slightly higher for failing men. Differences on F, Pd, and Pa were significant at the 5% level.

On the Strong, there were no significant differences between the two groups in relationship of stated occupational choice to performance on scale of test occupation.

Correlation of the Biographical Inventories of the representative sample of men with the differences between bright passing and bright failing men on the Inventory showed significant relationships between high school and college grades. When score on Biographical Inventory was combined with ACE score and correlated with first quarter grades, the multiple r approached that between high school GPA and first quarter GPA.

I-A-1

SPIELBERGER, Charles D., and KATZENMEYER, William G., "Manifest Anxiety, Intelligence and College Grades", J. Consult. Psychol., (1959), 23:278.

Purpose:

The purpose of the present study was to examine additional evidence on the relationship between MAS scores and GPAs and to determine whether this relationship varied as a function of the intellectual level of the student.

Setting:

The MAS was administered to all students in the Introductory Psychology course at Duke University for six consecutive semesters and GPAs were obtained for the particular semester during which a student had taken the MAS. MAS scores, ACE scores, and GPAs were available for 640 men. In order to determine whether this relationship was influenced by the intellectual ability of the subjects, the total sample was divided into the following groups on the basis of ACE scores: lower 20%, middle 60%, and upper 20%.

Results:

The intertest Pearson r's were MAS - GPA - .14; MAS - ACE - .11; ACE - GPA - .29 (all significant at .01 level). Even when IQ was not taken into account there was a small inverse relationship between MAS scores and grades.

When intellectual ability was added, the MAS - GPA correlations for these groups were -.04, -.18 and -.05, respectively. Tests for linear and curvilinear regression indicated GPAs were unrelated to MAS scores for the low and high intelligence groups; the test for linear regression for the middle group yielded an F of 13.06 (df = 1,390, p .001). Grades varied inversely with anxiety level for the average aptitude subject. College work appeared to be too difficult for low aptitude students whose poor grades were unrelated to their MAS scores. High aptitude students tended to obtain good grades regardless of their anxiety level.

Summary:

Previous studies may have failed to find a significant relationship between MAS scores and grades for one or more of the following reasons, (a) failure to take intelligence into account, (b) heterogeneity with respect to IQ, (c) inclusion of both male and female subjects.

I-A-1

STUIT, Dewey Bernard, "Differential Characteristics of Superior and Inferior Students", School and Society, (1937), 46:733-736.

Purpose:

To compare certain objectively-determined characteristics of superior and inferior students enrolled in the Teachers College of the University of Nebraska.

Subjects:

The subjects were 112 students (92 women and 20 men) who composed the upper and lower fourths of the Teachers College freshman class. Students in the upper fourth were considered to be superior students and students in the lower fourth were considered to be inferior students.

Procedure:

The following information was obtained for each student: (1) scores on the Ohio Psychological Examination, Iowa Silent Reading Test, and the Bell Adjustment Inventory, (2) high school records--total number of units and the units in Math, Latin and Foreign Languages, and (3) the age of the student. The averages for each group were then compared.

Results:

1. On the Ohio Psychological Examination, the mean scores were 84.84 for the superior group and 65.43 for the inferior group. This is more than 11 times the standard error of difference (.80).
2. On the Iowa Silent Reading Test, the mean scores were: Comprehension - 158.25 for the superior and 117.80 for the inferior group; Rate - 31.82 for the superior and 26.02 for the inferior group.
3. On the Bell Adjustment Inventory the mean total scores were 39.77 for the superior and 41.57 for the inferior group. The difference was not significant.
4. There were no significant differences in the following high school characteristics: (1) number of units taken, (2) number of units in foreign language and (3) number of units in language.
5. The average superior student is approximately a year younger than the average inferior student.

Conclusions:

The superior student at the Teachers College was younger than the inferior student, scored very high on the Ohio Psychological Examination, and showed above average reading comprehension. His reading rate was also superior to that of the inferior student. The degree of adjustment as measured by the Bell Adjustment Inventory was apparently not a differential characteristic of either group. The number of units and pattern of work taken in high school failed to differentiate between the superior and inferior student.

I-A-1

THORNTON, G. R., "The Use of Tests of Persistence in the Prediction of Scholastic Achievement", J. Educ. Psychol., (1941), 32:266-274.

This study briefly reported the results of the administration of several tests of persistence to 98 men at the University of Nebraska. One battery of tests (tests not listed) measured a previously identified factor called WD (characteristics not given). The other battery measured a factor Pl (a factor related to performance in verbal tasks) and consisted of a verbal task which became increasingly difficult. The subject was allowed to work as long as he wished and the score was the time he continued to work. The WD and Pl scores were then correlated with GPA and the grade received in a Psychology class. The correlations obtained were WD and GPA .17, WD and Psychology grade .18. The Multiple Correlations were WD, Pl and GPA .29, and WD, Pl and Psychology grade .25. A correlation of .20 is necessary for significance at the .05 level. The correlations obtained here were considerably lower than those obtained in other studies.

On the basis of this and other studies, Thornton developed the hypothesis that the amount of correlation between grades and scores on persistence was a function of the degree to which the test situations were similar to school situations. He suggested that the best way to increase the predictive value of objective personality tests as a means of predicting scholastic achievement was not by making the tests better measures of persistence but rather by planning the test situations to resemble more closely the tasks and social relationships found in the classroom. Based on these ideas, Thornton developed a formula predicting academic achievement:

$$X = \frac{2AY}{3B} + \frac{A}{3}$$

where X = future scholastic achievement.
A = the average T score for grades in school.
B = the T score for scholastic ability in comparison with other students in the same given school.
Y = the T score for scholastic ability in terms of classmates in the new school.

No evidence was given for the value of this formula.

Thornton believed that the most useful tests for predicting scholastic achievement would be those designed to sample performance involving more general aspects of student reactions rather than persistence, suggestability, cooperativeness, etc., separately.

I-A-1

TODD, F. J., TERRELL, G., and FRANK, C. E., "Differences Between Normal and Underachievers of Superior Ability", J. Applied Psychol., (1962), 46, 3:183-190.

Purpose:

The purpose of the study was to obtain information concerning certain nonintellective factors in underachievement. The approach taken was to compare underachievers with normal achievers by testing the following hypotheses:

Hypothesis I - Underachievers will reveal greater need for love and affection in social situations and less need for recognition status in academic situations than will normal achievers.

Hypothesis II - Fewer underachievers will have decided on a specific vocational goal than normal achievers.

Hypothesis III - A larger proportion of normal achievers than underachievers will perceive their doing well in their course work as important to attainment of their long-range goals.

Hypothesis IV - Underachievers have lower expectancy of doing well in academic activities than do normal achievers.

Procedure:

Since this study was to investigate only bright under and normal achievers, only students with SAT scores at the eightieth centile or above were used. Those with grade point of 3.00 or above out of 4.00 were considered normal achievers, those with GPA below 2.00 were underachievers. The final sample contained 177 normal and 77 underachievers who were sophomores, juniors, and seniors at Colorado University. Sixty-six normals and 39 underachievers were male.

The subjects were assembled in three groups and administered two inventories and a questionnaire, each of which collected data on one or more of the hypotheses. The three instruments administered were the Goal Preference Inventory (GPI) developed by Liverant (1958), the Inventory of Expectations (IE), developed by Jessor and Mandell (1959), and the Vocational Goal Questionnaire (VGQ), devised for this study.

Results:

Hypothesis I - the GPI provided a score for need for academic recognition (AR), and a score for need for social love and affection. As predicted, the need for AR mean score for male achievers (25.9) was significantly higher (P .001) than that for male underachievers (21.59). In females the difference was not significant. Since need for love and affection score was a component of the AR score the results were just in the opposite direction.

Hypothesis II - Two items of the VGQ pertained to this hypothesis. Results showed that significantly more normal achieving females had identified ideal vocational goals, but no significant difference existed for males. On the other hand, significantly more normal males had chosen vocational goals while there was no significant difference for females.

Hypothesis III - Three VGQ items pertained to this hypothesis. Chi-square test indicated that for the male subjects a significantly greater proportion of normal achievers felt that doing well in course work was important to reaching their long-range goals. For females the difference was not significant.

Hypothesis IV - The IE provided information relevant to expectancy for academic recognition while the VGQ contains items relevant to expectancy for success in attaining vocational goals and success in course work. The results of the IE and the VGQ items supported in both the male and female groups the prediction that normal achievers would have greater expectancy for academic success than would underachievers. Some of the VGQ items supported the hypothesis for only one sex, however.

Conclusions:

The results provided in varying degrees, support for all four hypotheses and thus, in some measure, differentiated bright normal and underachievers with respect to the four factors of goals, needs, expectancy for success, and expectancy that certain activities will lead to certain desired goals.

However, other studies as well as this one showed a difference between the results pertaining to different sexes. Thus, any attempt to understand the underachiever must account for these differences. An attempt to do this was included in the discussion.

I-A-1

UHLINGER, Carolyn A., and STEPHENS, Mark W., "Relation of Achievement Motivation to Academic Achievement in Students of Superior Ability", J. Educ. Psychol., (1960), 51:259-266.

Purpose:

This study was designed to examine the relationship between achievement motivation and academic achievement, and to assess the relative predictive and convergent validity of measure of achievement motivation.

Subjects:

The subjects were 72 freshman college students who had been granted Special Merit Scholarships. They were quite homogeneous as to aptitude, previous scholastic performance, socioeconomic background, age, and marital status.

Procedure:

All subjects were asked to (1) estimate grade point average they expected to make during the semester (E), (2) the lowest GPA that they would consider at least minimally satisfying (MG), and (3) the highest GPA they thought they could make if they worked as hard as they could (Max). They were then given the EPPS, the Goal Preference Inventory (GPI), and the Incomplete Sentences Blank (ISB). EPPS scores were computed for n Ach (need achievement) and n Nus (need nurturance). The GPI yielded scores on AcR (need for recognition-status in academic situations) and SoR (need for recognition-status in social situations), and SLA (need for love and affection). The ISB was socred for need value (NV) and Freedom of Movement (FM). On the basis of GPA two groups (high achievers and low achievers) were selected for comparison.

Findings:

(1) For need for achievement, none of the standardized measures distinguished between the high and low achievers. The only measure to do so was the discrepancy between E and MG. (2) High achievers had significantly (.05 level) higher SLA scores (and consequently lower scores on AcR and SoR combined) than did low achievers. (3) Correlation coefficients computed for the entire 72 subjects indicated no significant relationship between actual achievement and need for achievement as measured by ISB NV, EPPS n Ach, and GPI AcR. However, the correlation between the discrepancy score and achievement was significant at the .01 level. (4) Correlation between the need for recognition and grades was significant at the .05 level. (5) Intercorrelations between the four measures were low and only two were statistically significant.

Conclusions:

(1) The hypothesis that achievement motivation was greater for academically-minded students than for unsuccessful students, was only partially supported. (2) High achievers have a greater expectancy for academic success and higher minimal grade goals than low achievers.

Discussion:

It seemed likely that the variable need achievement might be more specific than general (its generality was low). It might not only be specific to the area of achievement (grades or money), but quite specific within each area (eg., science vs. humanities in the academic area). Further, achievement might depend to some degree upon many situational variables such as rewarding or punishing teachers. If this was so, the need achievement tests and the construct underlying them were of limited value.

I-A-1 also I-A-4

WATELY, D. J., and MARTIN, H. T., "Prediction of Academic Success in a College of Business Administration", Personnel Guid. J., (1962), October, 147-154.

Purpose:

The first purpose of this study was to determine the effectiveness of certain test measures in relation to academic success in the College of Business Administration at the University of Denver. The second concern was the development of regression equations for prediction purposes based upon those measures identified as related to academic success. The last phase consisted of cross-validating the results found in relation to the prediction of academic success for the business students included in this study.

Method and Results:

The use of results from seven test measures were investigated. The 1958 group was given the following tests: (1) The Allport-Vernon-Lindzey Study of Values, (2) The Bruce Business Judgment test, (3) The Bruce Supervisory Practices test, (4) The Guilford-Zimmerman Temperament Survey, (5) The Scholastic Aptitude Test. The 1959 students received the following tests: (1) The Bruce-Zimmerman Temperament Survey, (2) The Guilford-Zimmerman Temperament Survey, (3) The revised Minnesota Paper Form Board test, (4) The Scholastic Aptitude Test, (4) The Strong Vocational Interest Blank for Men and Women.

A total of 38 subscales were investigated. In addition, percentile rank in high school graduating class was included for both groups as another predictor variable. The criterion for academic performance was GPA computed for three quarters work. Academic success was defined as rank in approximately the top 25% of the class at the end of the first year. Academic marginality was defined as rank in approximately the bottom 25% of the class after the first year's work. The sexes were treated separately in this study.

Since the yearly groups were not drawn from statistically different college populations, their results were combined for the tests that were identical to both groups. The next step was that of finding which of the tests, if any, would differentiate significantly between the academically successful and the academically marginal groups. Approximations were made as to the actual make-up of the top and bottom 25% since comparisons were made with the 1958 and 1959 sex groups combined and in other cases with the groups separated. Ten differences were found to be significant beyond the .05 level when the extreme groups of males were compared. For the study of values, the data indicated that actually the marginal males were no more theoretical than the average male, but the successful men were less theoretical than average. It was also found that the successful males did not obtain higher social scores on the average than did the average student, but that the marginal males scored lower than the average male in terms of the norm data. The GZTS traits of General Activity, Restraint, Ascendance, and Thoughtfulness, also differentiated significantly between the two groups, with the successful scoring higher.

For the two groups of females, only two significant differences were found. These were the Restraint trait (GZTS) and the math scores (SAT). The Multiple R found between GPA and the eight variables that differentiated significantly between the extreme groups of 1958 males was .65. For the 1959 males the R was .82. It was felt that more efficient use of the regression equation would result if the variables that did not contribute significantly to the Multiple R were dropped. Four variables remained (restraint trait, thoughtfulness trait, and sociability trait of GZTS, Math and Verbal SAT and high school percentile rank) which correlated .82 with GPA.

In view of the nature of these results for 1959 males, it was possible to cross-validate the findings with the 1958 group. Using the beta weights found for the 1959 males to predict GPA for the 1958 men, the R between the estimated and actual obtained grades was .52.

Reversing the procedure, beta weights for these same variables were obtained for the 1958 males and the GPAs predicted for the 1959 males. In this case the R between the estimated and actual was .75. For the women, after eliminating variables that were not principal contributors, the R between the Restraint and Sociabiltiy traits, the math and verbal scores and HS rank was .78. In cross-validating, using the beta weights found for the 1959 females, the R between the earned and estimated grades for the 1952 women was .504, reversing the procedure obtained an R of .25.

Conclusions:

The Restraint and Thoughtfulness traits, plus the Math and Verbal sections of the SAT, and high school rank yielded a Multiple R of .82 with GPA. This was supported in terms of the cross-validation of the findings. It was suggested that the four test variables included in the regression equation for the males might be related to a common factor called "studiousness". For the females, the Restraint and Sociability traits, the Math and Verbal sections of the SAT, and high school rank may be an effective combination of variables for predicting academic success. The fact that the GZTS traits received large beta weightings in the regression equations for both males and females may prove to be especially significant in relation to groups, the academically successful females do not possess high scholastic ability and their grade averages are the result of other factors such as application and motivation. Other instruments, such as the Bruce Business Judgment test, and the Bruce Supervisory Practices test do not appear to be significantly related to success of business students.

I-A-1

WEISS, P., WETHEIMER, M., and GROESBECK, B., "Achievement Motivation, Academic Aptitude and College Grades", Educ. Psychol. Measmt., (1959), 19:663-666.

Purpose:

The purpose was to study the relationship between academic performance and achievement motivation as scored by the PPS and TAT.

Method:

In the present study, both measures of achievement motivation were administered to 60 male students in an Introductory Psychology class at the University of Colorado. The PPS measure was administered under standard conditions and scored according to the manual. The Picture Story measure was scored according to formula C with six of McClelland's TAT pictures (A, B, C, D, E, G) used as stimulus material. Also obtained on each S was grade point average (GPA) based on three semester cumulative average and performance on the Academic Aptitude Test (AAT), a locally constructed test which all subjects had taken as entering freshmen.

Product-moment correlation coefficients were computed among the measures; sample sizes varied slightly, depending on how many of the subjects had scores available on a given test.

Results:

The correlation between the two achievement motivation measures was .26 with P for a one-tailed test at about the .03 level, N - 59. Both of the measures of achievement motivation predicted grade point average. For the PPS measure, the r was .4, N = 49, P = .05, while for the Picture Story score, the r was .34, N = 49, P = .05.

Combining the motivation measures with the academic ability measure yielded a still higher prediction of grade point average of .55, p. 01; AAT and PPS combined in the prediction of grade point average yielded a multiple R of .64, N = 39, .01, while AAT and Picture Story measure combined yielded a multiple R of + .63, N = 39, .01. The multiple R produced by attempting to predict grades from all three measures was .68, N - 39, p. 01. The correlations between AAT score and the two achievement motivation measures were nonsignificant.

Conclusions:

The two measures of achievement motivation might actually be indices of the same thing, although they measured it differently. A combination of ability and motivation measures seemed to be a powerful prediction of academic performance.

I-A1

WITHERSPOON, P., and MELBERG, M. E., "Relationship Between Grade Point Averages and Sectional Scores of the Guilford-Zimmerman Temperament Survey", Educ. Psychol. Measmt., (1959), 19:673-674.

Purpose:

To determine possible relationships between aspects of temperament and earned grade point averages of first semester college freshmen.

Method:

Description of variables: The ten scales on the Guilford-Zimmerman Temperament Survey used were (1) general activity, G, (2) seriousness, R, (3) ascendance-submissiveness, A, (4) social interest, S, (5) emotional stability, E, (6) objectivity-subjectivity, O, (7) friendliness-hostility, F, (8) thoughtfulness, T, (9) masculinity-femininity, M. Each scale was correlated with the student's first semester grade point average.

Results and Conclusions:

(1) No significant relationship exists between the investigated first semester college freshman grade point averages and the scaled scores, G, A, E, S, O, F, and T.

(2) A low but statistically significant relationship between the R - purposive scale score and grade point did exist.

(3) A low significant relationship between the P - personal relations score and grade point average did exist.

(4) A low significant relationship between the M - masculinity-femininity score and grade point average did exist for the 112 male students included. A low relationship between an M score and grade point average for women existed but was not significant.

YOUNG, J. B., "How Emotional Traits Predispose to College Failure", J. Educ. Psychol., (1927), 18:631-636.

Purpose:

To discover the importance of some non-intellectual factors on involuntary withdrawals of college students at Colgate University.

Procedure:

Freshmen who entered Colgate were given three tests: (1) a standardized intelligence test, (2) Colgate Mental Hygiene Test (measured introversion-extraversion), (3) Colgate Mental Hygiene Test (measured psychoneurotic traits).

Records of the classes of 1928 and 1929 were studied to discover possible causes other than intelligence for success or failure in college work.

Results:

A. Intelligence: Intelligence was not considered a significant factor for determining failure. In the two years only about three-fifths of the failures came from the low side of the intelligence scale.

B. Introversion-Extraversion: In the 1928 class an equal number of introverts and extraverts were dismissed from poor scholarship during the first year. Extraverts and introverts also failed in equal numbers during the first year of the class of 1929. The combined records indicated that approximately three-fifths of those who failed were above the average in extraversion. The members of the two classes were then divided into four groups to discover how combinations of extraversion and introversion with high and low intelligence affected scholarship. The four groups were (1) those students above average in intelligence and introvert, (2) those students above average in intelligence and extravert, (3) those students below average in intelligence and introvert, and (4) those students below average in intelligence and extravert. The last three groups had exactly the same number of failures, while the first group had less than one-half of their quota of failures.

C. Psychoneurotic Traits: A zero relationship was found between intelligence, introversion-extraversion and psychoneurotic traits. Students were divided into four groups on the basis of the combination of psychoneurotic traits and introversion-extraversion. The four groups were: (1) those students who were unstable emotionally and introvert, (2) those students who were unstable emotionally and extravert, (3) those who were stable emotionally and introvert, and (4) those who were stable emotionally and extravert.

Group 4 was found to have the highest concentration of failures. Group 4 had twice as many failures as any of the other groups. Throughout the decile ranges of psychoneurotic traits there was a consistent tendency for increasing failures among the extroverts as their psychoneurotic traits decreased. Fewest failures were found among the unstable extraverts, most among the stable extraverts, with an even graduation between these extremes.

I-A-1

ZALMON, W. R., "The Relationship of the Bernreuter Personality Inventory Ratings to Traits Exhibited by Students in College Courses", M.A. Thesis, University of Nebraska, (1943).

Purpose:

The study was an attempt to determine the relationship between the several personality traits measured by the Bernreuter Personality Inventory and academic success as indicated by average semester grades in all courses, semester grades in English I, and first semester grade in Military Science.

Procedure:

One-hundred-fifty-nine male students at the University of Nebraska were included in the sample. Their scores on the Bernreuter Personality Inventory, their average overall semester grade, semester grade in English I and semester grade in Military Science were obtained. The Bernreuter scores and semester grades were correlated.

Results:

Only one correlation coefficient was significant; the one between the introversion-extroversion scale (B3-I) and Military Science (r = .23). High introversion (intraspective and artistic thinking) was related to high grades in Military Science. This did not support the author's hypothesis that extroversion would be characteristic of the good student in Military Science. Personality traits as measured by the Bernreuter Scale had very little relationship with performance in English I. None of the correlations was above .06. Overall scholastic average was more highly correlated with extroversion than any of the other Bernreuter traits. This correlation was not significant.

I-A-2

EGNER, Robert E., and OBELSKY, Alvan J., "Effect of Stereotyped Attitudes on Learning", J. Educ. Psychol., (1957), 48:207-212.

Purpose:

The purpose was to determine if any significant correlation existed between those scoring high and low on a sterotype test, and performance in various subject areas.

Subjects:

The subjects were 218 juniors taking an Introductory Psychology course at Northland College. A subsample was taken from those who scored at the extremes and consisted of 20 low and 20 high scorers who were equated for intelligence.

Procedure:

All subjects were given the Inventory of Beliefs Test which is purported to detect individuals with stereotyped beliefs. The test consists of items expressing stereotyped beliefs and the subject is asked to state if he agrees or disagrees. Academic records for each group were obtained and the number of students in each group (stereotyped or nonstereotyped) who received grades of "C" or above in Humanities, Social Science, Biological Science, Mathematics, and Natural Science was determined.

Findings:

Nonstereotypes performed appreciably better in the Humanities and Social Sciences whereas in the Natural Sciences and Mathematics the stereotypes were superior. In Biological Sciences both groups performed about equally well.

Conclusions:

(1) The student most likely to succeed in courses which involve relatively high levels of flexibility of outlook is the nonstereotype. (2) As one moves from the concrete to the abstract a larger percentage of stereotyped students begin to manifest evidence of frustration, culminating in more frequent failure, once their threshold of tolerance has been exceeded.

Discussion:

The authors discuss the problem of "de-stereotyping" concluding that it is a problem for education. They believe that this is a problem that educators must face because "...studies of the authoritarian personality, which deal with rather specific forms of stereotype, give adequate evidence that the fate of our democratic institutions themselves is at stake in this issue."

I-A-2

HOWARD, Victor, and WARRINGTON, Willard, "The Inventory of Beliefs: Changes in Beliefs and Attitudes and Academic Success Prediction", Personnel Guid. J., (1959), 37:299-302.

Purpose:

To test the following questions: Do students' beliefs and attitudes change during a four-year college period? Is there a relationship between these beliefs and attitudes or between changes in them and academic success?

Method:

The instrument used was the Inventory of Beliefs, developed by the Cooperative Study of Evaluation in General Education of the American Council on Education. The inventory was first administered to 1,942 freshman students entering Michigan State University in September, 1951. It was administered again during the last week of spring term, 1952, to a random sample of 569 of these subjects. At the end of the senior year 109 seniors were retested. In order to examine the nonrespondents, a comparison was made of the means obtained on the first two administrations and of the grade point averages of those subjects who did not respond to any of the three invitations with those who did respond.

Results:

Classifying the Inventory of Beliefs scores of the students retested according to sex (as had been done in an original study) a re-examination of the significance of the differences between the means of the first and second test administrations at the beginning and end of the freshman year showed gains significant beyond the 0-01 probability level for both male and female groups.

For the same 109 subjects, the differences between the means of the third test administration at the end of their senior year and those of the second administration at the end of the freshman year showed gains significant beyond the .01 level for both male and female groups. An examination of the retest scores and senior grade point averages of the 109 subjects showed no significant differences between males and females.

For the same 109 subjects, the intercorrelations between the three test administrations for these 109 students with the senior grade point average suggests that some sex differences exist. For males, no significant correlations were obtained. However, for females, a significant positive relationship was discovered between the inventory scores obtained both at the end of the freshman year and at the end of the senior year with senior grade point averages.

For the 109 subjects tested at the end of their senior year the gain achieved on the inventory over the three-year period between the second and third test administrations, when compared with the senior grade point average, showed no significant correlations for either the male or female group. This was also true for the one-year period between the first and second test administrations and for the four-year period between the first and third test administrations.

Conclusions:

As measured by the Inventory of Beliefs, beliefs and attitudes change significantly for male and female subjects both during the freshman year and between their freshman and senior year. Stability was indicated in that there was a tendency for females who gained most or least during their freshman year also to gain the most or least during their sophomore, junior and senior years. There is no apparent relationship between performance on the Inventory or between changes in IB scores, and academic performance as indicated by senior grade point average for males, and only a slight positive relationship for females. This would seem to suggest that a degree of flexibility or adaptability is not related to academic success.

JUOLA, A. E., "The Development of an Academic Predictor Scale Based on Students' Attitudes Toward Education", Pers. Guid. J., (1963), 42:381-387.

Purpose:

This study was undertaken as an attempt to develop an empirically derived non-cognitive attitude-value scale for prediction of academic performance. This article is concerned with the second stage in the development of the Academic Attitude Preference Inventory (AAPI).

Method:

Approximately 2000 Michigan State University students were divided into middle achievers (46%), high achievers (27%), and low achievers (27%) on the basis of first quarter GPA, according to sex and curricula. A 261-item scale was administered, using either a four-alternative Like-Dislike response scale or a four-alternative Agree-Disagree response scale for each item. Following item analysis, tentative scoring keys were developed for combined sex samples, since the initial analysis failed to significantly differentiate between responses by sex. Of the 261 original items, 101 were selected for the final scale.

Results:

Product moment correlation coefficients were found between the AAPI score and each of several academic attainment criteria. Similar correlations were found for the Brown-Holtzman Survey of Study Habits and Attitudes (SSHA) and also the College Qualification Tests (CQT) and subscores. Inter-correlations were found between the AAPI and the SSHA and the CQT. Approximately 75 percent of the items had internal consistency in sexes of 0.27 or higher. Trends of high and low achievement respondents were recognized and discussed. Internally-consistent items seemed to describe the high achiever as more highly motivated, having higher academic aspirations, being interested in the theoretical and abstract, and having broad rather than narrow intellectual interests. An outline of expected efforts in further development of the AAPI was given.

I-A-2

MERRILL, W. R., and NEIDT, C. O., "Relative Effectiveness of Two Types of Response to Items of a Scale on Attitudes Toward Education", J. Educ. Psychol., (1951), 42:432-436.

Purpose:

To determine the "relative effectiveness of two types of response to items of a scale on attitudes toward education."

Setting:

Subjects: Two-hundred-and-one second-quarter freshmen students attending Iowa State College.

Criteria: Ninety statements of attitudes to some aspect of education or attendance at college, selected because of their high correlation score in an earlier project were used. The 90 items were put into two forms:

(1) a five point response scale (Liker technique)
(2) paired statements where the subject was asked to select the statement most indicative of his attitude. The paired statements composed 45 items.

Procedure:

One-half of the subjects took the single-statement form first and one-half took the paired-statement form first.

The subjects were also asked to indicate the number of hours they had studied during the last two weeks.

Results:

"The split-half reliability coefficients for the two forms of the scale were computed and found to be .67 for the single-statement form and .45 for the paired-statement form." It was found that 1.7 times as much administration time was required for the single-statement form as for the paired-statement form. The correlation between the two forms of the scale was .668.

Conclusions:

Differences in the validity of the two responses are negligible, the paired-statement being the most feasible.

"Although the paired-statement form of response yielded a low reliability coefficient in this investigation, its effectiveness in terms of correlation with an external criterion suggests that it be subjected to further research and be given more consideration in the construction of attitude scales."

I-A-2

MYERS, R. C., and SCHULTZ, D. G., "Predicting Academic Achievement with a New Attitude Interest Questionnaire", Educ. Psychol. Measmt., (1950), 10:654-663.

Purpose:

This is a report of an attempt to develop a "questionnaire designed especially for inquiring into pertinent attitudes, interests, and motivations of entering college freshman", i.e., an instrument which would measure nonintellective factors associated with subsequent academic achievement.

Setting:

Subjects: Members of an eastern women's liberal arts college freshman class (Class of 1951) totaling 355 and all applicants for the 1948-49 freshman class (Class of 1952), totaling 346 were the subjects in this study. (The questionnaires of applicants who were not admitted were discarded.)

Criteria: An assigned achievement index based on the comparison of Freshman Year Grade Point Average (GPA) and scores on the Scholastic Aptitude Test (SAT-V and SAT-M) were used.

Procedure:

The Class of 1951 was administered the 328 item questionnaire in October of 1947 (three weeks after admission) and the questionnaire was revised to 145 items. Throughout the 1948-49 academic year, the revised questionnaire was administered to all applicants for the Class of 1952, and those questionnaires received from nonadmitted applicants were eliminated from this study. By allowing the Class of 1951 to complete the freshman year, their GPA's were obtained and the following was undertaken:

1. "Give each member of the Class of 1951 a relative achievement rating or index, i.e., an index of freshman GPA relative to scholastic aptitude.
2. Compare the questionnaire responses of overachievers with those of underachievers in order to find those items showing the greatest response differences.
3. Compare the questionnaire responses of the Class of 1951 with those of the Class of 1952 in order to determine what effect the difference between post-admission administration (Class of 1951) and pre-admission (Class of 1952) had on average responses.
4. Prepare a key by which to score the Class of 1952 questionnaires, based upon overachiever-underachiever response differences found in the Class of 1951, and adjusted for pre-admission-post-admission response differences that may have been found to effect keyable items.
5. Using this key, score the Class of 1952 questionnaires, thus obtaining a predictor of academic achievement for the members of this class."

Each item had five Likert-type response possibilities and scores from 1 to 5 were assigned to these. In this manner a key was developed such that "the higher the score the greater the prediction of overachievement...(and)...to give additional weight to extreme responses", and this key was used to obtain three different overachiever-underachiever scores for the Class of 1952. The three different scores were based on 45 items, 31 items, and 19 items.

Findings:

The three means and standard deviations of the overachiever-underachiever scores were 128.1 mean, 14.9 SD on 45 items; 88.1 mean, 10.0 SD on 31 items; and 57.6 mean, 815 SD on 19 items. The low split-half reliability coefficients (.52, .41, and .45) indicate that the items are characterized by heterogeneity.

When GPA's were available for the Class of 1952, the multiple correlation of SAT-V and SAT-M with Freshman Year GPA was found to be .52. The intercorrelations of these measures indicate that the measures were fairly stable.

Correlations of the three overachiever-underachiever scores with the achievement index for the Class of 1952 were .12 for the 45 item scores, .10 for the 31 items score, and .14 for the 19 item score - thus the questionnaire predicted freshman year academic achievement of grade performance relative to scholastic aptitude to this extent. Combining the questionnaire score and the two SAT scores increased the multiple correlation from .52 to .53 and by combining it with the SAT scores and adjusted high school average, the multiple correlation increased from .63 to .64.

Conclusions:

The authors feel that "these facts tend to confirm the point that the questionnaire score is a member of the battery which is independent of the other predictor variables" and that "the difference in time of administration may have made the key based on the 1951 Class less appropriate for the responses of the 1952 Class" than if they had responded under similar circumstances.

I-A-2

SCHULTZ, D. G., and GREEN, B. F., Jr., "Predicting Academic Achievement with a New Attitude-Interest Questionnaire", Educ. Psychol. Measmt., (1953), 13:54-64.

Purpose:

To cross-validate the questionnaire scoring key developed from the Class of 1952 responses by using it for the Class of 1953.

Setting:

Subjects: All applicants for admission to the freshman class (1949-1950) who were actually admitted and who actually attended the same women's eastern liberal arts college used in the original study by Myers and Schultz.

Criterion: The achievement index as used in the original study - "the difference between the actual Freshman-Year College Grade-Point Average and the most probable Grade-Point Average predicted, by means of a multiple-linear equation, from the verbal and mathematical scores on the College Board Scholastic Aptitude Test."

Procedure:

From the data obtained from the Class of 1952, items having the highest ratio of item-criterion correlation to item-test correlation were selected and three sets of items were selected by eliminating the poorest items from the larger set. Therefore, the three resulting sets consisted of 83 items, 69 items (83 minus 14 of the poorest items), and 55 items (69 minus 14 poor items).

Findings:

Validity coefficients reported for the three sets were .46 for the 69 items and .43 for the 83 items and the 55 items. All of the scores for the Class of 1953 were highly correlated and split-half reliability coefficients were low - probably indicating heterogeneity of the items selected.

The reported correlations for the Class of 1953 for the three sets correlated with the achievement index were .12, .14 and .13, respectively. These values are very similar to those reported in the original study. When compared with the Scholastic Aptitude Test scores and with adjusted high school average, these three sets "were not as unrelated...as had been true of the questionnaire scores reported by Myers and Schultz." By combining the score correlation increased from .47 to .48 for the two SAT scores. The 55-item score had no effect on the multiple correlation when combined with the battery of SAT scores and high school average (adjusted).

Conclusions:

The obtained results fail to warrant use of the questionnaire for selection purposes; however, the similarity of the validity coefficients obtained in the two experiments tend to indicate the possible existence of a stable, although small influence, and if so the techniques for identifying and measuring this more precisely are yet to be found.

I-A-3

ASHER, E. J., and GRAY, F. E., "The Relation of Personal History Data to College Success", J. Educ. Psychol., (1940), 31:517-527.

Purpose:

The purpose of this study was to determine if personal history had any relation to college success, and if so, to see whether such data, when combined with ability test scores materially increased the accuracy of prediction of college success.

Method:

1. To set up a measure of college success.
2. To validate the items on the personal history data cards.
3. To obtain a personal history score from the most valid items on the card.
4. To determine the relation of the personal history score to college, and to scores the general ability test.

Procedure:

College success was measured by the following formula:

$$\frac{\text{Total number of grade points}}{\text{Total number of hours carried}} \text{ X Number of semesters in college}^{**}$$

**For students finishing in less than 8 semesters, a bonus point was added for each semester. For students taking longer than 8 semesters, 2 points were subtracted for each additional semester.

All of the 200 students used in the above procedure were ranked according to their college success score, and they were then divided into five equal groups. All items on the personal history data cards were then tabulated, and compared among the five groups. Those items with no differentiation were dropped. Items with differentiation were used and coefficients of correlation were computed. These coefficients were all judged, resulting in a list of 15 items that were termed indicative of differentiation. These items were than assigned a numerical number in relation to their correlation coefficients. A personal history score was computed from this, and their score was compared with the college success scores and with the general ability test scores.

Results:

The personal history scores yielded a positive coefficient of .398 with the college success scores. It was also significant to note that this was based only on 15 items of the card. There was practically a zero correlation between the personal history scores and the general ability test scores (.067). The correlation between college success scores and the general ability test scores was .362, slightly less than the correlation between the personal history and college success. Multiple coefficient of the personal history and the general ability test scores was .521. A summary of the items revealed that according to this experiment the student most likely to succeed at Kentucky University was one who was under 20, not born in Kentucky, whose parents were not born in Kentucky, whose parents attended college, who hadn't earned any money of his own, who didn't have to work his way through college, who didn't have to borrow money to get through college, who had held important or responsible offices before coming to college, who had earned prizes, honors, etc., who had skipped one or more half grades, and who didn't fail any courses in grade school or high school.

Conclusions:

The conclusion was that the personal history data definitely had correlation with college success, and that when this information was combined with general ability tests, the predication of college success could be improved.

I-A-3

BOLENBAUGH, L., and PROCTOR, W., "Relation of the Subjects Taken in High School to Success in College", J. Educ. Res., (1927), 15:87-92.

Purpose:

This study was undertaken to determine whether those who entered Stanford with an academic pattern of high school work achieved a higher standing in college subjects than those who entered with a vocational pattern.

Subjects:

The subjects for the study were 605 men who entered Stanford University in the years 1921 and 1922 and who completed at least one quarter.

Procedure:

All subjects were followed through their college careers. Those who had less than three units of vocational work were listed as having followed an academic pattern in high school while those who had three or more were listed as having followed a vocational pattern. This resulted in 494 with an academic pattern and 111 with a vocational pattern.

The two groups were then compared on the following characteristics: (1) high school grade average, (2) college GPA, (3) median score on the Thorndike Intelligence Examination for High School Graduates, and (4) reason for leaving college (graduated, quit, and poor grades). Various correlations were then computed between high school grades, college grades and Thorndike scores.

Results:

1. 65.4% of the academic group and 60.4% of the vocational group made acceptable grades (C average or above).
2. 33.8% of the academic group and 39.6% of the vocational group made unacceptable grades.
3. There was no significant difference in the high school and college grades of the two groups.
4. The median Thorndike scores were 71.5 for the academic group and 67.6 for the vocational group.
5. The correlations between high school grades and the Thorndike were .17 for the academic group and .35 for the vocational group.
6. The correlations between college and high school grades were .28 for the academic group and .49 for the vocational group.
7. The correlations between college grades and the Thorndike were .45 for the academic group and .37 for the vocational group.
8. The multiple correlations using all three variables were .48 for the academic group and .54 for the vocational group.

Conclusions:

The student who takes a vocational program in high school is just as good a college risk as the student who takes an academic program.

I-A-3

DUFF, O. L., and SIEGEL, L., "Biographical Factors Associated with Academic Over and Underachievement", J. Educ. Psychol., (1960), 51:43-46.

Purpose:

The purpose of this investigation was to determine the relationship between certain biographical or personal history data and academic over and underachievement.

Subjects:

The subjects for the study were 1,454 freshmen at the University of Miami.

Procedure:

The Biographical Inventory for Students (BIS) was administered to all subjects. This inventory (developed by Siegel) yields scores in ten areas: sports and action, social activities, heterosexual activities, religious activities, literature, music and art, political and intellectual activities, socioeconomic status, economic independence, dependence on the home, and social conformity. Over and underachievers were identified on the basis of scores on the American Council on Education Psychological Examination (ACE) and grade point average (GPA). ACE and GPA decile ranks were then subtracted from the ACE decile ranks, giving an index of discrepancy. BIS scores were then correlated with the discrepancy indices for male, female, high ability, and low ability subjects.

Findings:

(1) A negative relationship was found between effective utilization of academic ability and the degree of participation in physical, social and heterosexual activities.

(2) High ability female overachievers tended more to conform to social requirements, participate more actively in religious activities and less actively in aesthetic activities than did high ability female underachievers.

(3) A high relationship was found between male low ability overachievers and participation in political and intellectual activities.

Conclusions:

(1) Females tended to utilize their measured academic ability more effectively than do males. (2) Participation in activities classified as sports and action, social and heterosexual was quite generally related in inverse fashion to the effective utilization of measured academic achievement. (3) High ability females who overachieved conform more to society, participate more in religious activities and less in aesthetic activities than do any of the other groups investigated.

Discussion:

The author speculated that high participation in extracurricular activities may require that less time be spent on academic preparation or that participation in these activities and underachievement may both by symptomatic of low academic drive. The later explanation seemed to be the most likely.

I-A-3

DWYER, P. S., "The Correlation Between Age at Entrance and Success in College", J. Educ. Psychol., (1939), 30:251-264.

Purpose:

This study was undertaken to examine some previously reported correlations between age at the time of college entrance and grades and to further analyze these results using the subcorrelation technique.

Procedure:

Between the years 1927 and 1933 various product-moment correlations had been computed at the University of Michigan between age at the time of entrance and the grades of different groups. Correlations were computed for the different colleges and classes. This data was obtained from the files and analyzed. Previous studies report that the "young" group and the "old" group have higher averages than the "middle" age group. Since this describes a non-linear pattern, the subcorrelation coefficient technique was used. Thus, two regression equations were developed. One was applied to the 16 to 21 group and the other was applied to the 22 and over group. These correlations were computed for all sutdents entering the University of Michigan in 1930.

Results:

1. The original product-moment correlations were generally low and negative and ranged from +.062 to -.223. Slightly more than half were significant.
2. The subcorrelations for the 1930 group were .222 for the 22 and over group and -.179 for the 16 to 21 group.

Conclusion:

There is universally a negative relationship between age and freshman scholastic success. This relationship can be analyzed further into two trends. There is a negative trend up to the entering age of 21 and a positive trend from age 22. This relationship appears to continue for a given entering group with perhaps a tendency for the coefficients to decrease.

Discussion:

Although there is some relationship between age at the time of entrance and college success, it is unlikely that this relationship is large enough to have any significant predictive value.

I-A-3

ECKERT, R., "Analyzing the Superior College Students", School and Society, (1935), 41:69-72.

Purpose:

Superior students at the University of Buffalo between 1926 and 1930 and who were in the upper or lower quarters of the grade point distribution for this period were studied.

Findings:

1. Comparisons concerned with high school background.

a. Among individual subjects, English literature and chemistry were found to show the greatest difference between the two groups in average achievement.

b. The least differentiation was found in Spanish II.

c. The results showed that it was the student's reaction to the particular subject (the degree to which he could demonstrate his mastery in the field) rather than the character or number of subjects he had pursued in high school which was related to differential achievement in college.

2. Comparisons using the University of Buffalo Personnel Blank (pertains to non-scholastic factors).

a. The able students credited themselves with more persistence in problem-solving, greater disturbance after unkind remarks, and less ability in meeting new people and in participating in social activities.

b. Greater writing and clerical aptitude was found for the superior group while the inferior students showed a higher rating on athletic abilities.

c. Superior students showed a slightly greater interest for languages.

d. The superior student was found to have a more rapid reading rate, a keener memory, and a greater amount of time devoted to study.

e. Much more interest in teaching was found in the superior group.

f. Twenty-five statements on social, economic and religious problems were included where the student was asked to express his own attitude on a five-point scale.

Of the eighteen statements which tended to differentiate the groups, all but four indicated a greater degree of liberalism for the superior achievement group. Evidence showed that the poorer students were more suggestible and tended to agree with the statement whether it was worded to favor the conservative or radical view.

I-A-3

FLORY, C. D., "Skeletal Maturity and Achievement of College Freshmen", *J. Amer. Assoc. Collegiate Registrars*, (1940), 15:223-228.

Purpose:
This investigation was designed to study the academic progress of a group of freshman men in the light of their skeletal or physiological maturity.

Subjects:
The subjects for the study were 95 freshmen at Lawrence College. These subjects fell into the following age groups: 19 were between 17-2 and 17-11; 59 were between 18-0 and 18-11; and 17 were above 19. The youngest was 17-2 and the oldest 21-2.

Procedure:
X-rays were obtained of the hand of each subject. In addition, the following information was obtained from the Dean's office: (1) I.Q.'s which were derived from the Otis Higher Examination; (2) percentile ranks on the ACE Psychological Examination; and (3) GPA's for the freshman year.

The subjects were divided into three maturity groups on the basis of the X-rays. Maturity was judged by the degree of closure of the radial and ulnar epiphyses in the right hand. The 74 subjects who within ± 9 months, 17-9 to 19-3, of the average age (18-6) for skeletal maturity in males were studied as a group.

Results:
1. The younger students were more intelligent.
2. Of the older students (above age 19-0), 18 or 94% were mature; while only 4 or 21% of the younger (below age 18-0) were mature.
3. In the 17-year-old group, 4 or 21% were mature, 8 or 42% were maturing and 7 or 37% were immature. The mature group had a mean I.Q. of 116 and a mean GPA of .98.
4. Analysis of the data for the 74 students in the 17-9 to 19-3 age group revealed that: (a) the most immature students were slightly more intelligent, but the difference was not significant, and (b) the mature group had significantly higher GPA's than the immature group.
5. When the mature students in the 19-plus group were compared with the immature and maturing 17-year-olds, the 17-year-olds were found to be more intelligent, but the 19-plus group was superior in GPA. The differences were not significant.
6. When the 17-year-olds were ranked according to maturity and achievement, the rank order correlation was .40. Ranks in maturity correlated .37 with ranks in intelligence.

Conclusions:
Older mature students, even when somewhat less intelligent, are likely to exceed immature students in achievement. There is a definite positive correlation between skeletal maturity and the GPA's of 17-year-old freshmen.

I-A-3 also I-A-2

HOPKINS, J., MALLESON, N., and SARNOFF, I., "Some Non-Intellectual Correlates of Success and Failure Among University Students", (Student Health Association, University College, London), British J. of Educ. Psychol., (1958), 28:25-36.

Purpose:

To determine whether there is a consistent association between academic achievement and (a) social, educational and economic backgrounds, (b) health, (c) pre-university orientation and (d) attitudes toward university life and study.

Method:

The chosen criterion of success was graduation with or without delay. A questionnaire was sent to all of the students of the college, who, having entered for a degree course between 1948 and 1951, had eventually left without obtaining a degree. A similar questionnaire was sent to a control group of graduates. An attempt to compare the groups with regard to their distribution of intelligence test scores, admittedly with only a small number of subjects did not show any differences between them.

Results:

A. General Background: There was a marked difference between the groups with regard to the kind of preparatory school attended. There was a definite preponderance (less than .001) of failing students coming from public and private schools, whether they were boarding or day, as opposed to grammar schools.

B. Significantly more of the control group reported that they had been receiving grants.

C. More students in the failed group had parents who had attended public or private schools.

D. More of the failed group reported having had illness which interferred with their university work or caused them to be absent (less than 0.001).

E. On the question of "Why did you come to UCL rather than a different college?", the controls more frequently gave the reason that "It was the best college for the chosen subject." The failures gave answers such as "access to theaters", "because friends were already at UCL", etc.

F. On the question of relationships with the other sex, the failed group frequently reported having had little or no relationship (less than .001). Also, fewer of the failed group got engaged or married while at the college (less than .01). Significantly, fewer students from the failed group reported having had any particular sex association while at the university (less than .01).

Discussion:

The failed group showed a trend indicative of social isolation and restriction of personal relationships.

JACKSON, R. A., "Prediction of the Academic Success of College Freshmen", J. Educ. Psychol., (1955), 46:296-301.

Purpose:

This study was designed to investigate the relationship between four tests (ACE Psychological Examination) Michigan State College Reading Test (MSCR), Test of English Usage (EU) and Arithmetic Proficiency Test (APT) and academic success as measured by GPA.

Procedure:

The means, standard deviations and intercorrelations of the five variables were obtained for 1687 men and 1296 women compiling one term of college work at Michigan State College. Multiple regression equations were developed using various combinations of the four tests.

Men and women were subdivided into eight subgroups on the basis of the number of credits carried. Analysis of variance was used to test differences in group means. Covariance techniques were then used to adjust grade point averages on the basis of Reading Test scores.

Mean scores on the ACE and MCSR were compared for men and women completing one term and for those withdrawing during the first term. Students were grouped into a trichotomy on the basis of GPA and their scores on the four tests were compared with these groupings.

Findings:

(1) Men have a significantly higher mean on the arithmetic test.

(2) Women have significantly higher mean on the MSCR, and the EU and have significantly higher grades.

(3) The mean scores of men and women on the ACE are not significantly different.

(4) The correlations between the four tests and GPA were: ACE .43; MSCR .50; EU .49; and APT .46.

(5) Multiple regression equations yielded no better prediction than the Reading Test alone.

(6) The mean grade point average increased regularly with increased credit load. When covariance techniques were used to allow for reading test scores the differences were still significant but not at as high a level.

(7) Men who had withdrawn during the first term had lower mean scores on the ACE and MSCR than those who completed the term. The mean scores for women were almost identical.

(8) A much greater percentage of the low ability group attain less than a C average than either of the other groups. Practically all of the high ability made a C average.

Conclusions:

(1) Women receive significantly higher grades than men.

(2) The reading test is the best predictor of academic success.

(3) Women tend to perform more nearly in accord with their measured ability than do men.

I-A-3 also I-A-1

JOHNSTON, M. W., "Factors Which Differentiate Achievers and Nonachievers Among University Freshmen", M. A. Thesis, University of Nebraska, (1944).

Purpose:

The purpose of this study was to identify the factors which distinguish between actual achievement and expected achievement. More specifically, the purpose was to find reasons for the discrepancies between test scores and scholastic achievement.

Setting:

The students were selected in terms of the discrepancies between their level of achievement and their aptitude and designated accordingly as achievers and nonachievers. Nine scaled score groupings on the pre-registration examinations were taken to be the basis of defining aptitude levels. A scaled score of "1" indicated that a particular performance ranked in the highest 5% and a "9" in the lowest 5%. Achievers were students whose weighted grade average was one and one-half sigma above the mean of the respective scaled score groups in which the students had been classified. Those who were one and one-half below the mean were classed as nonachievers. It must be kept in mind that achievers were those individuals whose grades were high relative to his pre-registration scores. A nonachiever had low grades relative to his pre-registration scores.

The subjects were 1,416 freshmen students at the University of Nebraska, in 1942-1943. The students' weighted average was computed for each semester and for the entire year. The folders in the general files in the Junior Division Offices were examined in order to obtain the data which were used in making comparisons between achievers and nonachievers. The folders contained such information as Personal Data Sheet, Principal's report and official transcript of high school record, etc.

Results:

The differences in mean ages for achievers and nonachievers were not statistically significant. In the main, however, the younger-than-average college male student was found to be a better-than-average achiever. The results showed that 90% of the men achievers ranked in the upper two-quarters in high school as compared to 50% of the nonachievers. Ten percent of the achievers ranked in the lower two-quarters as compared to 42% of the nonachievers. Approximately the same results were obtained for women.

Women coming from small graduating classes in high school were more likely to be achievers than those graduating from large classes. The results also indicated that men living in private residence were less likely to be achievers. Women living at home were also less likely to be achievers. Achievers as a group rated high on traits of self-confidence, persistence, emotional stability and ambition.

I-A-3 also I-A-2

MALLOY, J., "An Investigation of Scholastic Over and Underachievement Among Female College Freshmen", J. Counsel. Psychol., (1954), 1:260-263.

Purpose:

"This study was a report of certain attitudes, perceptions of school experience, friends, family relationships, and self-concepts that contributed to scholastic over and underachievement in female college students."

Subjects:

Three-hundred-and-nine women freshmen were obtained through the aid of the English Department of the University of Nebraska. "Tests of significance indicated that the women comprising the sample did not differ significantly from all women in the entire freshmen class with regard to such characteristics as course marks, ACE-L scores, and English achievement test scores."

Procedure:

Two groups (item analysis group and cross-validation group) were obtained by randomly dividing the completed Inventories.

Item Analysis Group - Using Flanagan's table to estimate validity coefficients and using the deviate technique for item selection and keying, a key for the Inventory was developed in which the criterion measure was the variance in college marks not explained by the student's ACE-L score and English achievement score.

A review of those inventory items which had estimated validity coefficients of +.26 or better (overachievement identifier) and of -.26 or less (underachievement identifier) was made in an attempt to identify characteristics of over and underachieving college women. Verification of responses was not attempted.

Findings:

Significant correlation (.446) was found between the Life Experience Inventory and grades. The multiple correlation (.587) was reduced (to .515) when the inventory score was omitted from the regression scheme. The partial correlation (.358) between the criterion and the inventory was significant at the one percent level.

Overachiever - independent, less frequently disciplined; was understood by her father; saw father as a success in business and as a parent; liked school work and having her learning evaluated, was more of nonconformist; felt she was more intelligent than average person; saw herself as a diligent worker, and had a high level of aspiration.

Underachiever - dated regularly; was disciplined more than her friends; saw her father as a poor businessman and less persistent than many people; was unconcerned with good grades in high school and saw them as unimportant; felt less accepted and adequate than her friends; was less persistent; was liked and was a conformist in many ways.

Conclusions:

"The Inventory significantly increased the prediction of college marks and successfully explained a portion of the unexplained variance in the criterion not already measured by the ACE-L score and the Nebraska English Achievement score." "The success of using biographical data in the prediction of college marks depended to a considerable extent upon the method of keying the items and the deviate technique appeared to contribute in this connection."

I-A-3 also I-A-2

MALLOY, J. P., "The Prediction of College Achievement With the Life Experience Inventory", Educ. Psychol. Measmt., (1955), 15:170-180.

**Purpose:**

1. To determine the effectiveness of a biographical inventory when used in conjunction with certain pre-registration test scores for the prediction of college marks. 2. To determine the relative effectiveness of two methods used to assign quantitative value to the responses of the items in the inventory. 3. To identify biographical experiences and attitudes associated with first semester academic achievement.

**Setting:**

The criterion selected for the study was first semester weighted college marks. The independent variables were ACE Linguistic scores, English Placement test scores, and Life Experiences Inventory.

**Design of Study:**

A structured questionnaire was created that was amenable to IBM scoring equipment. The items that composed the Inventory were determined by an item analysis group. Cross-validation groups' inventories were scored with this key. The independent variables were included in a multiple regression equation and college marks served as the criterion.

**Method of Procedure:**

After examining the available materials and articles, it was decided that the inventory should include the following information: (1) school experiences and attitude toward education, (2) self-appraisals, (3) family relationships, (4) choice and type of friends. The final form contained 201 items of multiple choice and paired statement (forced choice type).

**Selection of Subjects:**

Eight-hundred-and-seventy-five Inventories of first semester freshmen were used in this study. The key group numbered 434 (229 males and 155 females). The cross-validation group had 287 males and 154 females. There was no significant difference in mean performance on GPA's, ACE-L and English achievement scores for the two groups.

**Development of the Keys:**

The deviate technique was used, in which the responses of the key group to each item were correlated with that part of the criterion variance that was not associated with other test scores in the battery. Another method, the external criterion key, was constructed by making a distribution of the mark averages of the subjects in the key group. This method was inferior because of superior results obtained by the deviate technique.

**Findings:**

Analysis of Womens' Inventory scores: The Life Experience Inventory using the key derived by the deviate technique correlated .446 with marks, .735 with external criterion, .334 with English achievement score and

.304 with ACE-L. Using the external criterion key, the Inventory correlated .446 with first semester marks, .480 with English achievement scores and .478 with ACE-L.

Analysis of Mens' Inventory Scores: The r between the criterion and the independent variables was .555. The loss of the inventory grade key to the prediction scheme was not significant. The loss of those remaining was significant at the 1% level. The LEI using the deviate technique key correlated .776 with external criterion key, .378 with course marks, .323 with English scores and .189 with ACE-L.

There were 17 items that identified the male underachievers and 11 items that identified the male overachievers. Thirty-one such items described the female overachievers and 35 items directed attention toward underachieving traits.

1. Male underachiever - conformist, fewer personal convictions, bad study habits, less persistent, lower level of aspiration.
2. Male overachiever - high drive level, many friends, hard worker.
3. Female underachiever - conformist, less secure at home, less persistent, less ambitious than overachiever about scholastic success.
4. Female overachiever - nonconformist, anxious about school success, more independent, high aspirations.

Summary and Conclusions:

Biographical and personal history data resulted in increased predictive effectiveness of 1st semester college marks. The inventory significantly increased the prediction of college marks over and above the predictions now possible by the ACE-L, and English Placement test.

Student characteristics other than scholastic aptitude and achievement that contributed to college performance can be identified.

I-A-3

MARSHALL, M. V., "The Life-Career Motive and Its Effect on College Work", J. Educ. Res., (1935), 29:596-598.

Purpose:

To investigate the life-career motive and its effect on college work.

Subjects:

Ninety-one seniors at a liberal arts college. Thirty-six of these men had chosen their life work before college.

Procedure:

College marks were transmitted from letter grades to numbers for computations. Two comparisons were made: (1) on the basis of marks made during the freshman year, and (2) on the basis of marks made during the freshman, sophomore, and junior years.

Results:

Students who enrolled in college with vocational decisions were about half a grade higher on their work during the freshmen year, and about one-quarter of a grade higher on the work of the first three college years. In both cases the differences were statistically reliable. Scores on the Otis S-A test of Mental Ability were available for 29 students. These data showed a slight difference in favor of the group who had not made their choices before entering college.

The third comparison was between the average of marks made on subjects related to the vocations chosen with the average marks made on the other subjects. A difference of about half a mark was found in favor of subject related to vocational choices.

Conclusions:

Subjects who made their vocational choices before entering college made an average mark during their freshman year four-tenths of a mark higher than that of other subjects. Subjects with vocational choices before college had an average mark for the first three years approximately one-quarter of a mark higher than other subjects. With limited data, IQ was not a factor producing differences. The average marks made on subjects related to students' vocational choices were about one-half mark higher. The differences were all statistically reliable.

I-A-3

McQUARY, J. P., "Some Differences Between Under and Overachievers in College", Educ. Admin. and Supervision, (1954), 117-120.

Purpose:

To gain biographical information about over and underachievers in college.

Procedure:

Using the American Council on Education Psychological Examination as a criterion, two groups of males who were extreme over and underachievers in their first semester at the University of Wisconsin were identified. ACE scores and first semester grade point averages were converted to percentile ranks for the entire group. Students who earned a GPA one-half standard deviation or more above the GPA corresponding to his ACE total score were called overachievers. Those with one-half or more standard deviations below GPA corresponding to their ACE total score were called underachievers. There were 50 males in the overachieving group and 27 underachievers. The two groups were compared on information items such as marital status of parents, father's occupation, education of parents, health history, school activities, and vocational preferences.

Results:

The indication is that overachievers are more likely to have less fortunate backgrounds as evidenced by: smaller percentage of fathers in professional or semi-professional occupations, same for mothers before marriage, less formal education for mothers, greater number of deceased parents and foreign born parents, and a higher percentage of self-support.

The underachievers had significantly higher percentages who received their worst high school marks in science and who listed the applied sciences (drawing, shop, wood working) and social studies as their favorite school courses.

Underachievers were more likely to go to college because their friends were going, for prestige, and for social enjoyment.

A significantly higher percentage of underachievers were "very uncertain" about their vocational choices. Overachievers were more likely to have made their choices at least one year before entering college.

I-A-3

MYERS, R. C., "Biographical Factors and Academic Achievement: An Experimental Investigation", Educ. Psychol. Measmt., (1952), 12:415-426.

Purpose:

The purpose of the study was to determine if personal history items appearing in the Application for Admission could add significantly to the prognostic ability of the College Board scholastic aptitude test and records of high school grades. Data concerning the class of 1951 (N = 355) were used to develop an optimum scoring key for the application blank. The scoring key was then validated against records of the 1952 freshmen class (N = 346).

Procedure:

For the original group, scores on the math and verbal sections of the SAT were compared with freshman year grade point average in order to arrive at a comparative index of degree of academic achievement for each student with aptitude held constant. This achievement index became the intermediate criterion against which items of biographical information were compared in order to determine relative value of these items as predictors of academic achievement.

Twenty-one biographical items were chosen as possibly adding to the accuracy of prediction. Each item was analyzed to measure its relationship to academic achievement as measured on the achievement index. All but seven items were eliminated because there was not a significant relationship. The items eliminated were: religion, participation in organized social and civic activities outside school, size of home town, country of residence, nativity of parents, birth order of student, and high school offices held. In constructing the scoring key, the items were weighted according to the level of significance of their relation to achievement as measured by the index. Those significant at 1% level had weight twice that of those significant at 5% level.

Results:

The students of the class of 1951 were scored with the key and the resulting biographical scores correlated with aptitude test scores (r = .00), with high school grade average (r = .17), and with freshman grade point average (r = .26). The multiple correlation of .62 of the aptitude tests and high school grades with freshman GPA was raised to R = .65 by addition of the biographical scores. The partial correlation with GPA with effects of aptitude and high school grades partialed out was .25 (significant at 1% level).

The application blanks of the class of 1952 were scored with the biographical key and correlated with verbal aptitude scores (r = .18), math aptitude (r = .10), high school grades (r = .17), and freshman GPA (r = .26). The multiple correlation of .63 of aptitude and high school grades with freshman GPA was raised to .65 with biographical scores added. The partial correlation of biographical scores with GPA was .19 in this group (significant at 1% level).

It was concluded that the addition in correlation made by the biographical score could be considered statistically significant.

I-A-3

ODELL, C. W., "The Effect of Early Entrance Upon College Success", J. Educ. Res., (1933) 26:510-512.

Purpose:

To determine what effect early entrance has upon college success.

Method:

The data were obtained from the complete high school and college records of almost two thousand students who had attended a large number of different high schools and colleges.

Although a few students in the group entered college before they were sixteen and a few others when they were twenty-two or older, it was only between these ages (16-21) that the numbers were large enough for reliability.

The average high school marks, average college marks, and differences were determined for these ages. The median lengths of time students remained in college and percentage of entrants who completed four year courses were also determined for the different age groups.

Results:

Both the average high school and college marks, with the exception of the twenty-one year old group, showed a tendency to decrease as age increased. For the youngest group, those entering at sixteen, the averages were 87.6 and 85.4 respectively, and decreased without exception for each older group through age twenty, for which the averages were 82.1 and 78.7.

The average decrease was about .15 for each increase of one year.

The coefficient of correlation of age and high school marks was -.20 ± .01, and of age with college marks -.24 ± .01.

Conclusions:

Age of entrance to college was not a significant factor in the relationship between high school and college marks.

I-A-3

OWENS, W. A., and OWENS, W. A., Jr., "Some Factors in the Academic Superiority of Veteran Students", J. Educ. Psychol., (1949), 40:499-502.

Purpose: ✓

This study was designed to evaluate the relative contribution of age, length of service and scholastic aptitude to the college achievement of a sample of student veterans.

Subjects:

The subjects were 149 veterans enrolled in the Winona State Teachers College. Their mean age was 23 years, 3 months, their average period of service was just over 37 months and their average ACE score was equal to the national average.

Procedure:

The ACE raw scores were changed into modified standard scores to insure their comparability throughout several editions of the examination represented in the data. Zero order correlations were obtained between GPA and each of the three variables studied. A multiple correlation was then developed using the three variables to predict GPA.

Findings:

Zero order correlations with GPA were: age .37, length of service -.02, and ACE .47. The multiple correlation coefficient was .57.

Conclusions:

Age was nearly as good a predictor of scholastic success for the veteran population as the ACE scores. The relationship between length of service and grade point average was low but negative. The correlation between ACE and GPA was increased from .47 to .57 by including estimates of the contributions of age and length of service to this relationship.

Discussion:

The relationship between age and GPA is explained by the fact that the older subjects are more serious about their work and better motivated and by the fact that there was a tendency for only the more capable older subjects to return to college after the war.

SCANNEL, D. P., "Prediction of College Success from Elementary and Secondary School Performance", J. Educ. Psychol., (1960), 51:130-134.

Purpose:

To study the prediction of college success using measures of school attainment and annually obtained, comparable achievement measures.

Procedure:

The scores of 3202 students at the State University of Iowa (SUI) and Iowa State College (ISC) were obtained on the Iowa Test of Basic Skills (ITBS) for grades 4, 6, and 8, and on the Iowa Test of Educational Development (ITED) for grades 9-12. High school rank (HSR), and freshman and cumulative GPA's were also obtained. Various regression equations were then developed using the measures to predict GPA.

Results:

1. The accuracy with which GPA could be predicted from achievement test scores increased from year to year. Grade 12 ITED scores correlated .634 with Freshman GPA and .535 with the cumulative GPA.
2. Combinations of test data from several years did not predict significantly better.
3. HSR was the best single predictor (r = .67 and .59).
4. Elementary ITBS scores correlate highly with college GPA.

Conclusions:

The equations developed could be used successfully at other four year institutions with similar admission policies. Elementary test scores could be used to predict college success.

I-A-3

SCOTT, C. M., "Background and Personal Data as Factors in the Prediction of Scholastic Success in College", J. Applied Psychol., (1938), 22:42-49.

Purpose:

To evaluate background and personal data items to determine their efficiency in guidance of freshman students entering Colorado State College of Education.

Procedure:

A questionnaire composed of items relative to background and personal conditions was administered to 280 freshmen who attended CSC of Education during the academic year 1934-35.

The students had completed a full year's work and had taken all of the tests contained in the Entrance and Classification Examination for Teachers Colleges.

Intellectual status was determined upon the basis of the American Council Psychological Examination and the combined raw scores on the English and Elementary Tests from the Entrance and Classification Examination for Teachers Colleges.

The various sections of the items in the questionnaire were assigned weighted numerical values based upon percentile scores obtained on the combined English and Elementary Tests.

Findings:

A coefficient of correlation of .370 was obtained between total questionnaire scores and average scholastic grades, .330 between questionnaire scores and American Council Psychological Examination score, and .395 between questionnaire scores and combined English and Elementary Test scores.

A regression equation based upon the Entrance Examination scores was used to predict the probable grades of fifty students. Grades also predicted with the questionnaire added resulted in a slightly higher degree of validity.

The item section (U12, size of the home population unit) was found to be statistically significant when differences in the medians of the sections on the questionnaire were tabulated.

I-A-3

WEITZ, Henry, CLARKE, Mary, and JONES, Ura, "The Relationships Between Choice of a Major Field of Study and Academic Preparation and Performance", Educ. Psychol. Measmt., (1955), 15:28-38.

Purpose:

To test the following hypotheses:

(1) Students who express a preference for a major field of study in college are better prepared for college than students who express no such preferences.

(2) When preparation for college is held constant, male students who express a preference for a major field of study perform better in college than do male students who express no such preference.

(3) When preparation for college is held constant, women students who express a preference for a major field of study perform about as well in college as women students who express no such preference.

Procedure:

Phase I: This study was conducted in two phases. The final experimental population for the first phase of the study consisted of 2111 freshmen who entered the liberal arts colleges of Duke University in the fall terms of 1951, 52, and 53, and who (Group A) either indicated an identifiable preference for a major field of study or (Group B) indicated no preference for both major field of study and vocational objectives. Data for men and women were treated independently. Differences in preparation for college work were estimated in terms of student test performance on the placement tests.

Results:

Phase I: (a) All differences in placement test performance for both men and women are in favor of the students who expressed a preference for a major field of study. (b) In the case of men, all but two of these differences were statistically significant at the 5% level. (c) With women, only half the differences were statistically significant at the 5% level or better, and in terms of the traits for which these differences were found, it is possible that the differences all have a common factor source.

Procedure:

Phase II: In this phase of the study, samples of 100 students who expressed a preference for a major field of study were matched with 100 students who had expressed no such preference and their differences in academic performance were studied. Separate investigations were made of male and female students using the same techniques.

Samples drawn from the original experimental populations were first matched on seven levels of academic preparation based upon their performance on the Placement Test of Scholastic Aptitude. When the samples of 100 students were matched with respect to scholastic aptitude, it was found that they were also matched with respect to all test measures. Academic performance was defined as the number of quality points earned during the first semester of the freshman year.

Results:

Phase II: For the men it was found that those expressing a preference for a major field earned a quality point average of 19.04 while those who expressed no such preference earned a quality point average of 14.51 (a significant difference).

For the women it was found that those expressing a preference for a major field of study earned a quality point average of 26.00 while those who expressed no such preference earned a quality point average of 24.90 (a non-significant difference).

Conclusions:

Students (both male and female) who have identifiable educational goals appear to be better prepared for college than those who do not. Men with educational goals appear to do better in college than those who do not have such goals. Women do about equally well in college whether they have educational goals or not.

I-A-3

WEITZ, Henry, and COLVER, R. M., "The Relationship Between the Educational Goals and the Academic Performance of Women, a Confirmation", *Educ*. *Psychol*. *Measmt*., (1959), 19:373-380.

Purpose:

To test the null hypothesis that the academic performance of college women who indicate preferences for major fields of study at the time they enter college does not differ from the academic performance of college women who are undecided about their major fields of study at the start of their programs.

Method:

Students who enrolled as freshmen in the Women's College of Duke University during the fall terms of 1951-1953 were used as subjects. Complete records were available for 815 students.

During orientation, students were asked to fill out questionnaires which asked for the student's proposed major field of study and vocational objective. The students were instructed to record "not sure" when they were undecided about either of these choices. On the basis of these responses the 815 women were divided into two groups as follows: (1) Group D (the decided group) - students who expressed a clearly identifiable preference for a major field. (2) Group U (the undecided group) - students whose choice of a major could not be identified. This division of students yielded 35 in Group D and 464 in Group U.

The total score on the American Council on Education Psychology Examination for College Freshmen was used as the predictor variable in the statistical analysis. The following criteria of academic performance were used: (a) grade point average at the end of the first semester, (b) percentage of each group being graduated, (d) number of semesters required to graduate, and (d) grade point average at graduation.

Results:

The mean scholastic aptitude test score of Group D was shown to be higher than that of Group U by a statistically significant difference. When only those students in both groups who were eventually graduated were considered, the significant difference in scholastic aptitude stood up. The difference between Group D and U with respect to the regression of first semester grade point average on the predictor variable was not significant.

The difference of 1.6% graduated in favor of the decided group was not statistically significant. The T value of 0.5 without correction for the effect of scholastic aptitude was what might have been expected by chance alone. Thus the hypothesis of no difference in academic performance between the two groups was confirmed. The D group, on the average, was graduated after completing 7.78 semesters while the U group required 7.83 semesters. This difference in favor of the decided students was a chance difference. At graduation, Group D had a mean grade point average of 2.84 while Group U had a grade point average of 2.85. This too was a chance difference.

I-A-3

WEITZ, H., and WILKINSON, J. H., "The Relationship Between Certain Non-Intellective Factors and Academic Success in College", *J. Counsel. Psychol.*, (1958), 4:54-60.

Purpose:

To explore the relationship between academic success in college and six kinds of non-intellectual experiences: (1) only child status at the time of entering college, (2) one or both parents deceased at the time of entering college, (3) parents divorced at the time of college entrance, (4) graduation from a civilian private secondary school, (5) graduation from a private military academy, (6) two or more the above. The hypothesis was that if a student experienced one or more of these conditions he would perform differently when aptitude and previous academic achievement were held constant.

Methods:

All freshmen men entering Duke University in September of 1954 who had experienced one of the above conditions were selected as the experimental group.

The initial selection yielded 253 cases for all categories combined. The remaining 412 men who entered in the same class were used as the source for the control group. From this group, 253 control cases were drawn and matched with the experimental group. Matching for each experimental subgroup was done on the basis of curriculum in which they enrolled, including general scholastic aptitude and test measures of achievement in reading, English, and mathematics. After eliminating various people in the matching process, the total number of cases remaining for this study was 240. The academic performance of each subgroup was then subjected to an analysis of variance using a treatment-by-level design. Levels were determined on the basis of total scholastic aptitude test scores.

Results:

Among the three home organization subgroups, the "only children" represented the single instance of a statistically significant difference in favor of the "normal" student. This difference had a p value of less than .01. "Deceased parents" and "divorced parents" enjoyed only slightly less academic success than their intellectually equal "normal" controls, but the differences could have been due to chance, p being greater than .20. The 34 freshmen who had been graduated from private civilian prep schools did less well than their public school controls, but the p value for the difference was between .10 and -.20. For the 27 military academy graduates, the p value for the difference in favor of the "normal" students was less than .01 suggesting that this was unlikely to be a chance difference.

Of the 42 subjects who experienced two or more conditions, more than half combined the only child status with one or more of the other conditions. This group did significantly less well in college than did their normal counterparts, with a p value of less than .001. In view of the fact that there is considerable relationship between academic performance and scholastic aptitude, one would expect the analysis by levels of academic performance in this study to yield relatively low p values. This is what happened in five of the six analyses. In the case of military academy graduates, the p value with three degrees of freedom was greater than .20, thus suggesting some chance relationship between academic performance and scholastic aptitude.

In general, any differences in group-by-level interaction were found to be chance differences. In five of the six analyses the p value was found to be greater than .20. In the case of the two or more conditions group, however, the p value for the interaction was between .05 and .10, thus suggesting that factors other than chance were influencing the interaction.

Summary:

The academic performance of the experimental groups during their first college semester was significantly inferior in the case of only children, military academy graduates, and students who had experienced two or more of the experimental conditions. Finally, it was noted that all groups who had experienced the investigated conditions performed less well than their "normal classmates", suggesting a trend despite the lack of significance.

I-A-3

ZORBAUGH, Grace, ZORBAUGH, S. M., and KUDER, F. G., "College Grades and Vocational Motive", School and Society, (1937), 46:62-64.

Purpose:

To study the relationship between college grades and students who had and had not chosen an occupation.

Method:

Groups of students of the same college age and the same average intelligence were selected for comparison. Each college class was divided into ten groups according to standing on the Ohio State University Psychology Examination. Forty groups were thus formed. The average point hour ratios (index of average grade) were then obtained for those in each group who had chosen an occupation and for those who had not chosen.

Results and Conclusions:

When age and IQ are controlled, whether or not a student has chosen an occupation makes no appreciable difference so far as his average scholastic standing is concerned.

DRAKE, C. A., "A Study of an Interest Test and an Affectivity Test in Forecasting Freshman Success in College", Teachers College, Columbia University, Contributions to Education, 504:1-52.

Purpose:

To isolate two factors, interests and affectivity, and attempt to measure some aspect of them objectively, and use the results in combination with the scores made on a standard, widely-used intelligence test in determining the part played by the two factors in producing the grades dealt with.

Method:

This investigation was planned to cover a period of five years, deriving its data from five successive freshman classes in Adelphi College.

The criterion: The criterion used throughtout this study (except where otherwise noted) was the simple arithmetical average of first semester freshman grades. Letter grades were given numerical equivalents, i.e. A+ = 97. Reliability was determined by the extent GPA's in one semester correlated with grades in other semesters for the same students.

Choice of tests: The ACE was used as a measure of intelligence or aptitude. The test measuring affectivity was the Pressey X-0 Test, parts 1 and 4, which were concerned with worries and dislikes.

The test was first given to 65 members of the class of 1930. The grades of all persons circling a given item in the test were averaged and this average was subtracted algebraically from the general average of the grades of all persons taking the test. The difference secured was given its algebraic sign, multiplied by 10 to make it an integer, and used as the value of the item in subsequent scoring of these tests.

The tests were then scored by the item values thus derived, and a gross score was obtained by adding these item values algebraically. The scores on both tests were added together and the total correlated with college grades. An r of -.8 was secured which seemed to confirm the value of the test for use in this study.

On the hypothesis that students of low scholarship might tend to mark more words of one or more of these types that students of 1h scholarship, a count was made of the number of words of each type marked on each test of the class of 1931. The number of words of each type was then correlated with grades. No significant correlations were found.

The author concluded that if the affective aspects of personality are to be measured as a significant factor in the prediction of scholarship in this situation, a new technique must be found or a new test.

I-A-4

GUSTAD, J. W., "Academic Achievement and Strong Occupational Level Scores", J. Applied Psychol., (1952), 36:75-78.

Purpose:

Since recognition of the importance of non-intellective factors in academic achievement, attempts have been made to find adequate measures of motivation which could be used to help predict such achievement. The Occupational Level Score (OL) of the Strong Vocational Interest Blank for men has been suggested as a possible measure of motivation. This scale, developed by contrasting the interests of high and low status men, has been described as measuring the eventual adult level of aspiration and the "staying power" or "survival power" in college competition. The present study was undertaken to see whether, at the senior college level where occupational choices are most clearly set in terms of major courses, OL could predict differential success. And secondly, to allow for appropriate or inappropriate vocational choice, judging in terms of profiles on the Strong.

Procedure:

Subjects consisted of 134 male junior students in the College of Science and Arts at Vanderbilt University. Scores of these subjects on the Strong Vocational Interest Scale, the ACE and quality point ratios (OPR), grade point average were obtained.

The interest profiles were examined to determine whether the subject's college major agreed with his interests as indicated by the profile. Either a primary or secondary pattern in his major was accepted as indicating an appropriate choice. Seventy-four percent of the group had appropriate choices, 26% inappropriate. The group was then further subdivided into four subgroups. Business administration majors with appropriate choice, pre-medical majors with appropriate choice, miscellaneous majors with appropriate choice, and all inappropriate choices. Following this, a distribution of OL standard scores was made for all 134 subjects and then divided into thirds as nearly as possible. Each of the four groups was further subdivided according to the following scheme: high (OL $>$ 56), middle (OL 52-56), low (OL $<$ 51).

Finally, analyses of covariance were conducted; one for each of the four groups separately, one for all appropriate choice cases, and one for all cases combined. The null hypothesis was that there were no differences in mean quality point ratios between the three OL groups when academic aptitude, measured by ACE, was held constant.

Results:

For all groups except the total, the F tests were not significant. It was hence concluded that OL, at this level, was not a significant predictor of scholastic success within advanced major fields, even when the subjects were pursuing curricula appropriate to their measured interests.

Whereas results for the separate groups were not significant, it was felt that differences in OL scores among the groups might have contributed to the significant F test for the total group. An analysis of variance was made of the OL scores of the four groups to check this hypothesis. The null hypothesis of no difference between the four groups was accepted. Thus it seems that difference in OL score did not account for the significant results for the total group analysis.

Conclusions:

(1) Considering each of the groups separately (major groups, inappropriate group, total appropriate group), there were no differences in grades between groups separated in terms of OL scores.

(2) For the total group, appropriate and inappropriate cases pooled, there were significant differences between scholastic achievement means of the OL groups.

(3) No differences were found between major groups in terms of OL score.

(4) Restriction of range on all three variables was suggested as the likely explanation of the negative findings.

I-A-4

HEWER, Vivian H., "Vocational Interest-Achievement-Ability Interrelationships at the College Level", J. Counsel. Psychol., (1957), 4:234-238.

Purpose:

In this study the relationships between achievement and interest were investigated with the ability factor controlled.

Settings:

Sample: 296 pre-medical male students entering the University of Minnesota as freshmen in the fall quarters of 1949, 50 and 52. These years were chosen because the SVIB was given prior to entrance.

Procedure:

The first part of the study was concerned with zero order correlations of the criterion, first quarter pre-medical honor point ratio with five predictors: (1) The Physician key of the SVIB, ACE, Ohio State Psychology Examination (form 22), (2) Cooperative English Test and H. S. Rank. In the second part of the study, ability was controlled experimentally. The method was to determine whether at a given ability level there was a significant difference in mean honor point ratio for first quarter pre-medical students whose interests resembled those of successful physicians as contrasted with those whose interests were dissimilar. The third and last approach used was one in which there was control of what might be called differential achievement. The differences between honor point ratios in two college subjects were correlated both with the difference between two keys on the Strong and with the Physician key. It was assumed that in subtracting one course grade from another the whole complex of grade getting ability would be removed. Any differences between grades could then be associated with another factor which could be interest. To test the assumption that the Strong keys themselves are correlated, a trial was run in which rank order r's were calculated between differences in honor point ratios in certain subjects and differences in standard scores on corresponding keys. The results gave no indication of any relationship.

Results:

In that portion of the study in which the relationship between interest and achievement was examined with ability controlled experimentally, no significant positive differences were found. Two differences were significant in the negative direction, one at the 5% and one at the 10% level. The conclusion was drawn that even with ability controlled, there was no evidence that vocational interest was related to achievement. There was some evidence, although not marked, that a relation does exist between scholastic achievement in a given curriculum and a related key on the Strong. The relation was evident when differences in honor point ratios were correlated with Strong keys and did not emerge when total honor point ratio or honor point ratios in a given course was related to the Strong. The relation did not emerge when the effect of ability on achievement was removed.

**Summary:**

At experimentally controlled levels of ability as measured on ACE 47 and OSPE 22, no differences were found in the achievement of a group of pre-medical students with interests similar to successful physicians as contrasted with those dissimilar interests. The correlations between score on Physician key of SVIB and differences in honor point ratios for certain courses were significant at the 5% level, suggesting some relationship between interest and achievement when a general achievement level was controlled.

I-A-4

MELVILLE, S. D., and FREDERIKSEN, Norman, "Achievement of Freshman Engineering Students and the Strong Vocational Interest Blank", J. Applied Psychol., (1952), 36:169-173.

Purpose:

The purpose of this study was to determine the relationship between measures of first-year academic achievement and scores on the Strong Vocational Interest Blank for Men for a group of freshman engineering students, all at Princeton University. Though the Strong was not originally intended as a predictor of academic success, it is widely used in educational counseling and it thus seemed desirable to investigate its relationship to academic achievement. It was particularly desired to relate scores on the Strong to an adjusted achievement measure, i.e., a measure of the amount by which the obtained average grade exceeded (or fell below) the average grade predicted on the basis of measures of ability. This adjusted achievement is often referred to as overachievement or underachievement.

Procedure:

Interest test scores were obtained for 93 students entering the engineering school. These included scores on all the occupational scales plus the interest maturity, occupational level, and the masculinity-femininity scale. The interest scales were converted to standard scores, and grade point averages for each student were obtained for the freshman year. Adjusted average grades which consisted of the difference between predicted freshman average grade and obtained average grade were obtained for each student. The predicted average grade was based on a multiple regression equation involving the College Entrance Examination Board test in science and student's rank in his secondary school graduating class corrected for achievement of past students from that particular secondary school.

Analysis consisted of correlating each Strong scale with average grade and with adjusted average grade.

Results:

Eight of the means on occupational scales were above 35: aviator (41.6), production manager (41.2), scientific farmer (38.8), engineer (37.3), printer (36.8), real estate salesman (36.3), personnel director (35.6), and mathematics-physics science teacher (35.4). The average engineering student, then, had relatively high interest in activities associated with occupations stressing scientific work and business sales and administration. Nine means on occupational scales were below 25. These were more varied in their areas of interest, but did include some scientific and business areas. Mean scores on the three additional scales (interest-maturity, occupational level and masculinity-femininity) were all above 50.

Considering that there were 42 Strong scales involved, on the basis of chance alone two correlations, between scale scores and grade point average, should be significant at the five percent level and none at the one percent level. Actually, seven correlations between Strong scales and grade point average were significant at the five percent level and one at the one percent level. The significance of correlations between Strong scales and adjusted grade average were not computed, since basic assumptions of the conventional statistics for the standard error of a correlation were not fulfilled by the adjusted average grade which involves the difference between two measures.

Significant positive correlations, at the 5% level or better, were found between grade average and Strong scales for psychologist (.32), chemist (.26), mathematics-physical science teacher (.24), mathematician (.22) and physicist (.20). Apparently, then, grades tend to vary directly with interests in activities associated with men in scientific fields.

Significant negative correlations were found between average grade and Strong scales for real estate broker (-.25), mortician (-.24) and banker (-.22). Evidently the more successful engineering students look with disfavor on activities commonly preferred by men in these fields.

When ability is held constant, as with the adjusted grade average, correlations tended to be higher. Positive correlations of .20 or higher were found between adjusted grade average and Strong scales for psychologist (.37), chemist (.29), minister (.26), math-physical science teacher (.25), mathematician (.24), physicist (.24), and physician (.20). Thus, those whose achievement exceeds their prediction tend to have interests like men in scientific fields.

A negative relationship exists between adjusted grade average and Strong scales for real estate salesmen (-.31), banker, (-.28), mortician (-.25), purchasing agent (-.23), and life insurance agent (-.20). The tendency is for those whose achievement falls short of that predicted to prefer activities associated with occupations stressing business detail and sales.

None of the correlations between the three additional Strong scales (interest maturity, occupational level, and masculinity-femininity) and freshman average or adjusted average grade was significant.

I-A-4

**MERCEY, M., "A Study of Interest Patterns of Successful and Unsuccessful Home Economics Students Entering College with Similar Achievement and Aptitude", J. Applied Psychol., (1942), 26:738-753.**

Purpose:

This study was designed to investigate the interest patterns of successful and unsuccessful students entering the New York State College of Home Economics with similar regents average and rank on the American Council Psychological Examination. It was desired to use the data collected in developing an aptitude test in Home Economics which would identify on entrance to college students needing special help in adjustment.

Procedure:

Sixty pairs of students were matched on high school achievement as reflected on regents Average and College Aptitude as indicated by rank on the ACE. These pairs differed in academic achievement as measured by grade point average at the end of their sophomore year, participation in activities of the university community, probable employability as indicated by summer job reports, achievement in the field of professional concentration, willingness of the class counselor to recommend for a position, and reports received by class counselor from instructors.

The groups responded to the Strong Vocational Interest Test and the differentiating value of each item was found by Ream's method. The percent of each group marking each symbol and the difference in percentages between the groups was found. The standard error of the difference was found by Yule's formula. An item was retained for further study if the difference was one or more times the standard error of difference. Of the 410 items on the Strong, 198 were found to differentiate between the groups.

Results:

The successful group showed more positive reactions to activities, amusements, and school subjects, which they had had an opportunity to experience. The unsuccessful group showed more positive reactions to occupations which they had no chance to know first hand and few positive responses to activities, amusements, and school subjects with which they had direct contact.

The successful group showed consistent interest in the occupations of dietetics, teaching and social work. The occupational preferences of the unsuccessful group formed a pattern usually associated with childish daydreams. They also showed a preference for escape literature.

The successful group accepted conventional standards of judgment in liking thrifty, progressive, religious people. The unsuccessful group disliked these qualities and favored opposing characteristics.

The successful group appeared more extroverted, interested in activities and amusements of the college community and in occupations there is some probability they may enter. The other group presents an interest pattern which suggests daydreaming and fantasy.

I-A-4

OSTROM, S. R., "The OL Key of the Strong Vocational Interest Blank for Men and Scholastic Success at College Freshman Level", J. Applied Psychol., (1949), 33:51-54.

Purpose:

Psychological instruments developed to measure abilities-aptitude and predict success in learning situations have not proved as accurate in their prediction as it was hoped. This may be due to non-intellective factors which cause some individuals to persevere through discouragements while others with apparently equal potential fail. The measurement of such non-intellective traits has proved most elusive.

The Occupational Level Key (OL) of the Strong Vocational Interest Blank for Men has been identified as a possible measure of the perseverance factor. It has been hypothesized that an excessively low occupational level score seems to be associated with lack of "staying power" or "survival power" in college competition. It is thus closely related to the general problem of level of aspiration and motivation.

The present study was intended to test this hypothesis and determine the relationship between the OL key of the Strong Blank and scholastic achievement at three levels of education at the college freshman level.

The freshman class at Syracuse University participated in a testing program shortly after enrolling. Two of the tests given were the Ohio State Psychological Examination and the Strong Vocational Interest Blank for Men. From the test data, six groups of 75 men each were chosen according to the following criteria:

High School Ability: Men whose OL scores were equal to a standard score of 57 or above and whose raw scores on the OSPE were 90 and above.

Average Level, High Ability: OL standard scores, 45 and below, OSPE raw scores, below 90.

Average Level, Low Ability: OL standard scores 57 and below, OSPE raw scores, below 90.

Average Level, Low Ability: OL standard scores 47-52, OSPE raw scores, below 90.

Low Level, Low Ability: OL standard scores 45 and below, OSPE raw scores below 90.

Results:

Honor point ratios were determined for each of the six groups. There was an even step progression in honor point ratio from low to high OL and from low ability (OSPE) to high ability except in one case, that of average to high OL in the low ability group.

An analysis of variance was performed with the six groups to test the null hypothesis that there was no significant difference between the mean honor point ratios of the groups with different OL and different ability. Both the OL hypothesis and the academic ability hypothesis were rejected at the 1% level.

Thus, a very significant relationship was established between honor point ratio and both academic ability and OL in the Syracuse University freshman sample.

Implications:

The result provides a strong case for the use of OL scores in prediction of college success. It does not justify use of the key as a single measure of motivation, but points to a place in a predictive battery. Motivation, if we assume it to be measured by the OL scale, appears to be a significant non-intellective factor in academic success.

I-A-4

REZLER, Agnes G., "Personal Values and Achievement in College", Personnel Guid. J., (1961), 39:137-143.

Purpose:

To examine the value system of underachievers as compared to achievers, when ability is held constant. Values will be identified with reference to college and vocational choice.

Method:

Of the group of male entering freshmen at Roosevelt University in September, 1958, 36 were selected on the basis of having been dropped from college prior to entering Roosevelt University and having scored above the 50th percentile on the American College Entrance Examination. Ten were gone after one semester and were not available for interview. Of 26 students contacted by mail, 15 responded. Two groups were formed of the 15 subjects--a failure group (A) and a passing group (B).

The control group (C) were freshmen with scores above the 50th percentile on the ACE and with high achievement (B average or better). All groups were matched by chance on religious affiliation, race, number of siblings in family, father's occupation and parents' educational background.

Mean scores for age, total ACE, total reading, interest maturity, occupational level, high school rank, and grade point averages were computed for all three groups.

Results:

The sample size was too small for statistical tests. However, for Group A, the tables show that great differences exist in reading and high school rank. "Failures" have a history of low achievement and do not read on the college level. There was a very small difference in terms of scores on IM for the Strong. For the OL key groups (A and B) underachievement could not be attributed to being in the wrong field as indicated by interests. With GPA, group A continued failing, group B passing average with no increase, group C high level of performance.

Results after interviewing: Group A (dropped-failed again). The end was decidedly more important than the means by which to get there. The prestige value attached to college was clearly reflected in this group. All felt that grades as such were not important.

There was a definite conflict between their values and their desires, i.e., self-discipline to study and desire for a good time. It was found that many were dependent upon their parents; they would like to, but could not yet, assert themselves directly and resorted to asserting themselves by not studying.

Group B (dropped-passed with C average). Like Group A, Group B did not feel that getting good grades has a value in and of itself. Some felt obligation to do well in major field but not otherwise. For some, selecting a major field that was in keeping with their interest and values.

All of the students had trouble paralleling their parents' values. They had confusion over which values to follow.

Group C (high achievers). With the exception of one student, all had definite vocational choice. The values that governed the vocational choices of these students were opportunity for self-expression, congenial working conditions, and working independently.

They were willing to work hard to obtain ends. Group C students had less conflict with their parents than Groups A and B.

I-A-4

RICHARD, W. A., "Effectiveness of the Gregory Academic Interest Inventory in the Prediction of Academic Success of Home Economics Students", M. A. Thesis, University of Nebraska, (1952).

Purpose:

This study was designed to determine how much scores on an academic interest inventory, when used with scholastic aptitude scores, contributed to the prediction of academic achievement and attrition or survival at the University of Nebraska.

Procedure:

The Gregory Academic Interest Inventory was administered to 102 freshman women enrolled in the Home Economics curricula. Their scores on the ACE Psychology Examination, their GPA's and the names of those who had withdrawn from the curriculum were obtained from school records. All test scores were converted to standard scores.

The eight most differentiating Gregory scales were chosen for inclusion in the regression equation by comparing the scores of the Home Economics students on each scale with the scores of a random sample of 100 women. This was done by ranking the scales for each group. Those scales whose ranks differentiated by five points were considered to be discriminatory. The eight scales were Secondary Education, Fine Arts, Commercial Arts, Home Economics, Business Administration, Psychology, Music and Biology.

To evaluate the contribution of each scale in the prediction of GPA, separate multiple regression equations were developed for each scale in combination with ACE Q and L scores. Analysis of variance of regression was then used to determine the significance of the relationship between each scale and GPA with aptitude held constant. Analysis of variance was also used to compare the scores on each scale of students who had withdrawn from the Home Economics curriculum by the sophomore year with those who continued in the curriculum.

Results:

1. Analysis of variance of regression revealed that none of the Gregory scales contributed significantly to the prediction of GPA.
2. The scores on the Gregory scales of students who withdrew from the Home Economics curriculum were not significantly different from the scores of students who remained in the curriculum.
3. The multiple correlation between ACE Q and L scores and GPA was .54. The zero order correlations were ACE L and GPA .50, and ACE Q and GPA .59.

Conclusions:

The eight scales of the Gregory Academic Interest Inventory, when used in conjunction with academic aptitude scores do not contribute significantly to the prediction of academic achievement and attrition or survival in the Home Economics curriculum at the University of Nebraska.

I-A-5 also I-A-2

AHMANN, J. S., SMITH, W. L., and GLOCK, Marvin D., "Predicting Academic Success in College by Means of a Study Habits and Attitude Inventory", Educ. Psychol. Measmt., (1958), 18:853-857.

Problem:

To investigate three aspects of the Survey of Study Habits and Attitudes: (1) its usefulness for predicting first semester grade point averages, (2) the ability of individual items ot differentiate between over and underachievers, (3) the discriminating power of the individual items.

Procedure:

Part I - The subjects were 301 male freshmen in Agriculture. A multiple regression equation was computed for the purpose of predicting first semester grade point averages. The prediction variables used were: Survey of Study Habits and Attitudes, Cooperative English Test, Reading Comprehension, Ohio State Psychological Test, Cooperative Natural Science Test, and Cornell Mathematics Test.

Part II - Subjects were 220 male freshmen in Agriculture. Over and underachievers were determined by the usual regression techniques. First semester grades were predicted by high school grade point averages and scores from Cooperative Natural Science test and the Cornell Mathematics Test. The predicted average was then compared with the actual average. If the actual average exceeded the predicted average by 4.0 the person was an achiever. If the predicted average exceeded the actual by 4.0 the person was an underachiever. These two groups were then compared in terms of their responses to each of the 36 items included in the scoring key for men. Chi-square values were computed in order to determine whether overachievers differed from underachievers in terms of their responses to each item.

Part III - For discrimination of items, the upper and lower 27% of the distribution of 284 female cases were used, whereas in the case of male students, the upper and lower 9% of the distribution of 1150 cases were selected. The index of discriminating power described by Johnson and Findley was computed for all items included in the scoring key for men and women. For those items which were scored, the correct response was considered to be the response listed on the right key. For those which were not scored, the "dorrect" response was considered to be the response which represented the most desirable habit or attitude.

Results:

The correlation between the SSHA and first semester grade point averages was not significantly different from zero. In Part II of the 30 chi-square values, only two were found to be significant at the 5% level. They pertained to lack of interest in school work. The mean score for the overachievers was 40.6 whereas the mean for the underachievers was 39.0 -- a non-significant difference. In Part III the values for the items included in the respective scoring keys tended to be satisfactory.

Summary:

The raw scores yielded by the SSHA failed to correlate significantly with first semester grade point averages and hence made no appreciable contribution to the prediction of these averages when included in a battery of tests selected for that purpose. In addition, male over and underachievers rarely differed in terms of their responses to individual items included in the instrument, and did not differ significantly in terms of raw score means. Finally, the discriminating power of the items was satisfactory.

I-A-5

BELL, H. M., "Study Habits of Teachers College Students", J. Educ. Psychol., (1931), 22:538-543.

Purpose:

This study was conducted to determine:
(1) When do students study?
(2) How long do they study?
(3) What is the nature of their study activity?
(4) How is the amount of study time related to intelligence and scholarship?

Method:

Students in General and Educational Psychology classes at State Teachers College, Chico, California, during the school year 1928-1929 were used in this study. A total of 127 kept daily records of their study time for 28 days. The study sheets provided columns for time of study, day of week, and whether morning, afternoon, or evening, type of study, whether reading textbook, outside reading, written assignments, or themes. During the year each student was administered the American Council of Education Psychological Examination. Grades were obtained from the Registrar's office.

Results:

The average study time per day per student was 111 minutes, or just short of two hours. Twenty-four percent of total studying was done in the morning, 32% in the afternoon, and 44% in the evening under artificial lights. Tuesday tended to be the best day for studying, and Friday the worst. Most studying involved reading activity, accounting for 82% of total study time. When students' grades and study time were correlated, a coefficient of .317 was obtained. Grades with intelligence correlated at .565. Intelligence correlated with study time was .003. The correlation between study time and class standing was .382.

Conclusions:

Most studying was done in the evening. The average time spent studying was one hour fifty-one minutes per day. Towards the end of the week there was a tendency to shorten the duration of the study periods. The vast majority of studying time was devoted to reading. There was definitely a positive correlation between study time and scholastic achievement.

I-A-5

BROOKS, F. D., and HESTON, J. C., "The Validity of Items in a Study Habits Inventory", J. Educ. Psychol., (1945), 36:257-270.

Purpose:

The study was designed to test the validity of items included in study habits inventories which are widely accepted as characteristic of good students as contrasted with poor students.

Subjects:

Two-hundred-and-seventy-six upperclassmen at De Pauw University.

Procedure:

In addition to the completed questionnaire, each student's De Pauw decile rank on the ACE Psychology Examination and his accumulated GPA were obtained from school records.

Each inventory was scored with an error being an answer opposite the supposedly good habit. Seven types of item analysis were made, using the critical ratio technique. They were: (1) using GPA as the criterion, the answers of the 50 best students were compared with the answers of the 50 poorest students, (2) high intelligence was held constant by matching 25 pairs for ACE rank and comparing the 25 with the highest GPA with the poorest 25, (3) low intelligence was held constant in the same manner, (4) the 50 best inventory papers (few errors) were compared with the 50 poorest, (5) the 50 highest ACE students were compared with the 50 lowest, (6) holding high GPA constant by matched pairs, the 25 highest ACE were compared with the 25 lowest, (7) the same procedure was used for low GPA.

Findings:

1. The number of items with critical ratios of 2.00 or more for each analysis were:

| Analysis | Number of CR's of two or more | | |
|---|---|---|---|
| | + | - | total |
| 1 | 11 | 2 | 13 |
| 2 | 5 | 0 | 5 |
| 3 | 3 | 1 | 4 |
| 4 | 55 | 0 | 55 |
| 5 | 14 | 8 | 22 |
| 6 | 0 | 4 | 4 |
| 7 | 0 | 4 | 4 |

2. The zero order correlations were GPA and errors -.171, ACE and errors -.067 GPA and ACE .359.

3. Students making good grades violated 27% of the rules recommended for effective study, whereas the poor students violated 31%.

Conclusions:

1. The number of good study habits apparently is not significantly related to the intelligence of the group nor to average grades received.

2. Many good students violate good study habits but this does not mean that study habits are unimportant.

Discussion:

Comparison of the results of this study with others using the same items reveals that the validity of study habits inventory items for one college population is different for that found in other schools.

I-A-5

BROWN, W. F., and HOLTZMAN, W. H., "A Study Attitudes Questionnaire for Predicting Academic Success", J. Educ. Psychol., (1955), 46:75-84.

Purpose:

This study was undertaken in an effort to construct and validate a self-rating questionnaire that would measure a student's study habits and attitudes toward studying.

Procedure:

One-hundred-and-eighty-eight items, representing various study practices and study attitudes, were compiled. The statements were assembled in questionnaire form with a rating scale following each item for the student to indicate if the item applied to him. The questionnaire was then administered to 117 freshmen at the University of Texas who had been selected from the Dean's list of honor students or from a list of students on scholastic probation. Item analysis was used to select the most discriminating items and the test was shortened to 102 items. The test was then administered to a new sample of 570 freshmen. A 2 x 5 contingency table was then used to compare items with GPA. On the basis of this analysis keys were developed (two for men and one for women). The tests were then scored and correlated with GPA.

Findings:

(1) The correlations between the questionnarie and GPA were .50 for men and .46 for women.

(2) Correlations between the questionnaire and the ACE were .30 for men and .21 for women, correlation with the CIT were .39 for men and .43 for women.

(3) The multiple correlations using the questionnaire and ACE scores with GPA were .72 for men and .74 for women.

Conclusions:

It was concluded that:

(1) Performance on the questionnaire is largely unrelated to the usual measures of academic aptitude.

(2) Performance on the questionnaire is significantly related to academic achievement.

(3) The questionnaire makes a unique and important contribution to the prediction of college grades.

Discussion:

The questionnaire is a promising instrument to aid in understanding students with academic difficulties.

I-A-5

CHAHBAZI, Parviz, "Analysis of Cornell Orientation Inventory Items or Study Habits and Their Relative Value in Prediction of College Achievement", J. Educ. Res., (1957), 51:117-127.

Purpose:

To determine the validity of the items of the Cornell Orientation Inventory compared to the validity of several aptitude and achievement tests and secondary school averages.

To develop a multiple-regression equation for predicting first-term college averages for the 1951, 1952 and 1953 freshman classes in the College of Agriculture at Cornell University.

Subjects:

Eight-hundred-and-thirteen sutdents in the College of Agriculture at Cornell University comprising 94 percent of the entire freshman classes in the academic years 1951-52, 1952-53 and 1953-54 were involved in the study.

Procedure:

A preliminary regression equation was developed using secondary school averages and scores on four tests.

1. Cooperative Reading Test (the speed of comprehension part)
2. Cornell Math Test
3. Cooperative Science Test
4. Ohio State Psychological Examination

The first-term college averages of the students were used as the criterion variables. The multiple coefficient of correlation (R) was .536. The coefficient of multiple determination was .278 (28.7 percent of the variance of freshman averages was accounted for). First-term averages were then predicted for 813 students. If the actual first-term average of any student was greater or less than the predicted first-term average of the same student by five or more points the Orientation Inventory for that particular student was sorted into one of the two groups ("overachievers" - "underachievers"). Item responses for the two groups were then analyzed for each item by counting the number of responses that were made by members of each group to each of the five choices possible in every item.

In computing the chi-squares, adjacent frequencies were combined in order to avoid expected frequencies under five so as not to violate the requirement of not-too-small expected frequencies.

Results:

Eight of twenty-five items proved to have predictive value. Six significant items were in the "Study Habits" area of the Orientation Inventory.

Partial scores were computed for all 813 students scoring only the eight significant items. Partial scores were than correlated with the criterion and with the other prediction variables. The original regression was changed and the multiple coefficient of correlation (R) for the second multiple-regression equation was found to be .569. The coefficient of multiple determination was .323.

Conclusion:

Multiple coefficients of correlation (R) for the first and second equations were .569 and .536 respectively. Coefficients of multiple determination were .323 compared to .287.

The second multiple regression equation which included the study habits part of the Cornell Orientation Inventory accounted for 32.3 percent of the variance of freshmen averages as compared to 28.7 percent in the previous equation.

I-A-5

COHEN, L., "Predicting Academic Success in an Engineering College and Suggestions for an Objective Evaluation of High School Marks", J. Educ. Psychol., (1946), 37:381-384.

Purpose:

This study was undertaken to develop a method of detecting those applicants for admission to a technical college who had the best chance of making a successful record in their freshman year.

Subjects:

The subjects for the study were 156 freshmen who entered Worchester Polytechnical Institute in 1941 and 180 who entered in 1942.

Procedure:

Scores for the 1941 group were obtained for the following tests: (1) ACE Cooperative General Achievement Tests in Mathematics, (2) ACE Cooperative Test In Physics or Chemistry (optional with student), (3) ACE Cooperative General Achievement Test in Reading, (4) The Iowa Silent Reading Test, (5) The Yale University Department of Personnel Study Test II, Form J, Parts 1 and 2, and (6) A Studiousness Questionnaire. High school grades were also obtained.

Test scores were converted to standard scores and various multiple correlation equations were developed to predict first semester GPA. In order to make them comparable, high school grades in mathematics and science were adjusted according to the certification classification given the high school by the New Endland College Entrance Certification Board. High school grades were then correlated with first semester GPA. Next a predictive index was developed by combining the best multiple correlation equation and high school grades. The prediction index was then correlated with first and second semester grades of the 1941 and 1942 groups.

Findings:

1. The best multiple correlation equation included the mathematics test, the chemistry or physics test and both parts of the Yale test, which correlated .55 with first semester GPA.
2. High school marks correlated .51 with first semester grades and .57 with the test battery.
3. The predictive index correlated .71 with first semester GPA and .64 with first year GPA for the 1941 group. It correlated .53 with first semester grades for the 1941 group.

I-A-5 also I-A-1

DiVESTA, Francis J., WOODRUFF, Asahel D., and HERTEL, John P., "Motivation as a Predictor of College Success", Educ. Psychol. Measmt., (1949), 9:339-348.

Purpose:

One purpose of the study was to check the stability of formulas for predicting college success. The contention was that a formula developed on data acquired in one year may not yield the same results with data gathered in another year. The second purpose was to investigate the contribution which motivational and adjustmental factors make to college success.

In a previous study it was found that the average of grades on the New York State Regents Examination was the best single predictor of college success with a correlation of .53 with first-term grade average. The Ohio State Psychological Test was found to be the best single test for prediction with a correlation of .45. A multiple correlation between a team of four weighted scores (Cooperative Science Test, Cornell Math Test, Ohio State Psychological Test and Regents Average) and first-term average was .57 for all students and .64 for those enrolled in the College of Agriculture.

At the time the study was completed, it was suggested that the inclusion of a measure of aptitude for college science, as independent of intellectual capacity as possible, and a measure of motivation might significantly improve prediction.

Procedure:

In regard to the suggestions made, a revised version of the Johnson Science Application test was included in this battery. An Orientation Inventory was also developed and given to all freshmen during the first month of college. The Orientation Inventory consisted of 17 multiple choice items such as "I review my lecture notes the same day they are taken" (choice of always to never) and "The average number of hours I spend on sports each week is...." (choice from none to over 28).

Results:

The Regents Average continued to be the best single predictor with a correlation of .54. The Ohio State Psychological Test was still the best single test in the battery with 4 = .36, not a significant drop from the .45 obtained previously.

The revised Johnson Science Application test had predictive qualities much like the Cooperative Science Test. But the most promising finding of the present study was the apparent usefulness, for predicting first-term grades, of a measure of motivational influences and certain obstacles to student achievement. The choices for each question on the Orientation Inventory had been graded from 1 to 5, one indicating that this factor would not hinder achievement and five indicating considerable hinderance. The items on the Inventory were scored by totaling the choices checked. The choices thus provided scores which correlated -.22 with the first-term grade average. Since a low score on the Inventory was associated with a high grade average, the more significant fact was that the Inventory scores correlated -.07 with the Ohio State Psychology Test and .08 with the Revised Johnson Science Application Test; hence, they appeared to be virtually independent in their measurement. When used as a team, the Ohio and the Orientation Inventory correlated .41 with grades and by adding the Johnson test to the team the correlation was raised to .60. The Regents Averages still correlated higher than any other single variable and the Orientation Inventory added more to the correlation than any other variable in the study.

A second score was derived from the Orientation Inventory as follows: A regression equation was made between first-term averages and the Regents Average. First-term averages were then predicted on the basis of the regression formula. If the actual first-term average was greater or less than the predicted average by five or more points, the Orientation Inventory for that particular individual was sorted into one of two groups--one group consisting of those individuals five points above predicted and one of those five points below. A chi-square was then computed on the observed and theoretical frequencies of responses to each item. Responses to five items were found to be significantly different between the two groups, and five other items indicated differences in the right direction. Following this analysis, the Orientation Inventory forms were scored again by totaling the responses given by the subjects on 7 of the most differentiating items. The correlation between the resulting score and first term average was -.32. When this part score and the Ohio SP Test were used as a weighted team, the correlation with first term average was .43 compared to .41 when total score on the Inventory was used. Multiple correlation of this part score on the Inventory, the Regents Average, the Ohio Test and the Johnson Test with first-term averages was .64.

Conclusions:

Analysis of the items indicated that motivational influences were important factors in scholastic success. Items referring to individuals' satisfaction with present course of study showed wide differences between groups. One item indicated that the individual who worked for his college expenses is probably among the most highly motivated.

The findings indicate that an extention in length of the Orientation Inventory with items centered around motivation, adjustment, and study habits, in that order of importance should be highly useful in prediction of academic success. Certain observations concerning items should be made. Not only should items be objective in the sense that the individual can easily estimate the actual time involved in factors asked for, but the items should be indicative of the area being measured and still be somewhat disguised as to their real purpose. The ultimate aim in constructing such tests is to discover items which may be used before the individual enters college.

I-A-5

GERBERICH, J. R., "Factors Related to the College Achievement of High Aptitude Students Who Fail in Expectation and Low Aptitude Students Who Exceed Expectation", J. Educ. Psychol., (1941), 32:253-365.

Purpose:

This study was designed to determine how significant certain personality traits may be in causing over and underachievement by studying their effects on academic behavior.

Subjects:

The subjects for the study were 198 students at the University of Arkansas.

Procedure:

A group of overachievers and a group of underachievers was determined on the basis of predicted GPA's based on ACE Psychological Examination scores. An overachiever was defined as a student who earned a GPA one standard deviation or more above his predicted GPA, a student whose GPA was one standard deviation or more below the mean was considered to be an underachiever. As a control, each over and underachiever was paired with a student of comparable ability who had earned a GPA near that predicted for him. This resulted in 55 pairs of high ability students and 39 pairs of low ability students.

Each subject (both experimental and control) was given a questionnaire which consisted of two types of items: (1) those concerning study habits, extra-curricular activities, reactions to the college situation and the like, and (2) those requiring a statement of the number of hours devoted weekly to each of a number of activities. The four groups were then compared in terms of their responses to these items.

Results:

1. Underachievers were found to have greater difficulty in paying attention in class, to have greater difficulty in using study techniques, to be fraternity or sorority pledges, to participate in more extra-curricular activities, to recognize a greater degree of difference in difficulty between high school and college work, and to spend more time at the movies and in optional reading.

2. The overachievers more frequently than underachievers were found to hand themes in promptly, to cram for examinations, to have a good place to study, to use the library for study, to like most of their classes and instructors, to feel that they get a square deal in their classes, and to spend more time in sleep, at meals, in the classroom and studying.

Conclusion:

1. At least two of the factors contributing to the low scholarship of underachievers are study techniques and time expenditures.

2. At least a partial explanation of high marks made by overachievers lies in careful study methods, attention to the demands made by instructors and elimination of extra class activities from their schedules.

I-A-5 also I-A-2

LUNN, M. K. M., "A Comparison of Under and Achieving Female College Students", J. Educ. Psychol., (1960), June, 109-114.

Purpose:

This study was designed to test the hypothesis that students who underachieve differ significantly from those who overachieve in their motivation for studying and in their attitudes toward the various aspects of the academic situation.

Subjects:

The subjects for this study were three groups, of 20 students each, selected from introductory psychology classes who were equated for scholastic aptitude as measured by the ACE Psychological Examination, but who differ widely in achievement as expressed in grade averages. All were sophomore women and the groups were equated for age and mean ACE scores.

Procedure:

The three groups consisted of (1) a group of underachievers (U)--students whose GPA is one-half SD below that predicted by the ACE, (2) a group of normal achievers (N)--students whose GPA falls within one-half SD on either side of that predicted by the ACE, and (3) a group of overachievers (O)--students whose GPA is one-half SD above that predicted by the ACE.

The subjects were administered the Survey of Study Habits and Attitudes and six items suggesting achievement motivation and attitudes toward the college situation from the Dole Vocational Sentence Completion Blank.

Findings:

1. On the SSHA the underachievers did not differ significantly from the normals on total score. Overachievers differed significantly from both underachievers (.01) level, and normals (.05) level.
2. Statistically significant differences were found between over and underachievers on four of the six SSHA tests. They were achievement drive (.01 level), procrastination orientation (.01 level), self-confidence (.01 level) and educational philosophy (.05 level).
3. The Dole sentence completion items revealed that overachievers tend to express a greater desire to improve themselves, less interest in social affairs, and had a clearer idea of what success would mean for them.

Conclusions:

1. The difference between successful and less successful students of similar aptitude is primarily one of attitude and motivation.
2. The less successful student shows a marked tendency toward procrastination.
3. The less successful student is less convinced of the value of a college education.

Discussion:

The author suggests research into personality functioning in attempting to determine the reasons for academic success or failure.

I-A-5

MAY, Mark A., "Predicting Academic Success", J. Educ. Psychol., (1923), 14:429-440.

Purpose:

To study the relationship of several variables to academic success and to determine how accurately the academic success of 450 Liberal Arts freshmen could have been predicted.

Method:

The following variables were studied:

a. Intelligence -- measured by the Miller Mental Ability Test and the Dartmouth Completion of Definitions Test.
b. Preparatory school work -- measured by the number of high school units and high school grade averages (or when possible by CEEB scores or Regents Examination scores).
c. The industry or application of the student -- measured by the number of hours spent per week in study.

Coefficients of correlation were computed between the various variables and first-semester honor points. Partial correlations between each variable and honor points (with each other variable systematically held constant) were then determined. Also, a multiple correlation equation was developed to determine the weights of each variable.

Findings:

1. The correlation between intelligence and honor points was +.60; with time spent in study held constant +.805; with high school averages constant +.532; with high school units held constant +.59. (The high partial correlation of +.805 was due to a correlation of -.35 between intelligence and time spent in study.)
2. The correlation between high school units and honor points was +.22; with intelligence held constant +.127; with high school average held constant +.071; with time spent in study held constant +.043; and with intelligence, high school average and time in study, all three constant -.218.
3. The correlation between high school averages and honor points was .406; with intelligence constant +.246; with time spent in study constant +.388, with units constant +.348; and with both time and intelligence constant +.318.
4. The correlation between time spent in study and honor points .32. (Partial correlations not given).
5. The highest multiple R weights were given to intelligence and study time; high school average and units were weighted very low.

Conclusions:

1. The most reliable means of predicting academic success is a combination of intelligence and degree of application (not available until the student is in college). The high school units and average factors can be dropped without serious loss of predictive ability.

2. A combination of traits and elements which will correlate as much as .90 with academic success will not be obtained until we can measure some of the more or less intangible traits of character and personality.

ROSS, C. C., and KLISE, N. E., "Study Methods of College Students in Relation to Intelligence and Achievement", J. Educ. Admin. and Supervision, (1927), 13:551-562.

Purpose:

To investigate the relation of methods of study to the intelligence of college students. To investigate the relation of methods of study to academic success in college.

Procedure:

Four-hundred-seventy-two students at Iowa State College answered a five-page questionnaire concerning various phases of studying in college. First was a section on general aspects of the problem. Following were sections on specific phases of concentration and distraction of attention when studying, memorizing, text book assignments, note taking and the study schedule. Instructions were given by one of the experimentors who attempted to motivate the subjects to answer the questions accurately and completely. It was felt this was accomplished.

Intelligence ratings and academic records were obtained for each subject. The papers were divided into three groups: freshman, sophomore, and juniors and seniors combined. These three groups were each subdivided into 9 subgroups. Divisions A, B, and C were the high ¼, middle ½ and low ¼ on the basis of intelligence in their group. Sections 1, 2, and 3 were the high ¼, middle ½ and low ¼ on the basis of academic scholarship of the subjects in the group. Each of these 27 subgroups was kept separate in tabulation of the data.

The subjects in the highest and lowest fourths in intelligence were then compared, and within those groups the subjects in the highest and lowest fourths of scholarship were compared. Thus, it was possible to compare the intelligent students who were successful with those unsuccessful, as well as all intelligent students with the least intelligent students both successful and unsuccessful. At the same time it was possible to compare intelligent, least intelligent, high scholarship and low scholarship students with results on the study method questionnaire.

Results:

On the relation of study methods to intelligence: Although students in high ¼ of college intelligence are four times as likely to rank in high ¼ of scholarship, the questionnaire reveals few differences between these groups in methods of study. The intelligent and unintelligent employ about the same methods. The authors conclude, however, that the method may be the same but the skill with which the method is used differs, the more intelligent using the methods more effectively. Of the students who have had specific instruction on how to study, the least intelligent profited most. Of the least intelligent fourth, 71% of these attaining high scholarship had training while only 25% of those ranking low in scholarship had such training. The intelligent fourth showed no such difference. The need for specific instruction in study methods seemed to be inversely related with intelligence.

Conclusions:

Concerning the relation of study methods and achievement (the method of study is important) on the same level of intelligence, as a rule the students of low IQ who were successful were employing good methods. Successful students use their time more effectively and distribute study periods wisely. For example, successful students usually read an assignment twice, while unsuccessful read it once, or in case of least intelligence, three or more times ineffectively. Successful students are more self-reliant, as in group study and in use of will-power to get started. They are more resourceful, as in discovering associations and memorizing dates, and more methodical in indexing and filing notes.

I-A-5

SMITH, D. D., "A Study of Teachers College Freshmen Who Do or Do Not Deviate From the Expected Level of Scholastic Achievement", Thesis, University of Nebraska, (1941).

Purpose:

This research was designed to study certain Teachers College freshman (University of Nebraska) who do or do not deviate from expected level of scholastic achievement. The problem was divided into two phases: (1) a study showing the value of tests in the prediction of scholastic achievement, and (2) case studies of students who do or do not deviate from the expected level of academic achievement.

Subjects:

The subjects for this study were 233 Teachers College freshmen, who entered the school in 1939 and who remained at the University for at least one year.

Procedure:

Each subject was given the following tests: The Ohio State University Psychological Test, the English Classification Test, the Iowa High School Content Examination, the Tyler Kimbler Test of Study Skills, the Pressey General Reading Test, the Chapman-Cook Speed of Reading Test and the Iowa Silent Reading Test. Also, first and second semester grade averages were obtained. All scores were given a percentile rank and placed in a normalized distribution (scales scores) based on nine intervals. Product-moment correlations were computed between each test and the grade averages.

Part II - On the basis of the test scores, the subjects were classified according to whether or not they consistently achieved at the expected level, above the expected level, below the expected level, or at inconsistent levels (unclassified). Members of the positive, normal and negative groups were chosen for detailed case studies. The positive group consisted of 11 women and 1 man and the negative group consisted of 6 women and 2 men and there were 8 women and 3 men in the normal group. Subjects involved in the case studies were given the Strong Vocational Interest Blank.

Findings:

(1) All prediction variables were correlated positively with scholastic achievement, with correlations ranging from .349 to .663.

(2) The tests having the highest correlation with scholastic achievement were: The Ohio State Psychological Test (total score .663, reading section .595), the English Classification Test (.629), the Iowa Silent Reading Test (.595), the Pressey General Reading Test (total score .639, vocabulary section .610).

(3) The best prediction of second semester grades can be made from first semester grades.

(4) In the individual case studies, four were found to have heavy work schedules (two in the negative group, one the neutral group and one in the positive group).

(5) Women in the negative group were more dissatisfied with their vocational choice.

(6) The women in the positive and neutral groups considered themselves well informed in regard to their vocational requirements at the time of college matriculation. This was not true of the negative group.

(7) Students in the normal and positive group used more effective study methods.

(8) Students in the normal group appeared to be better adjusted socially than either the negative or positive group. The positive group seemed to be compensating for this social inability with academic achievements.

Conclusions:

This study points out the necesssity of providing students with more vocational information. The chances for success in college must be interpreted according to each individual. The best prognostic and achievement tests must be used. Individual interviews are invaluable in interpreting the needs and requirements of each student.

I-A-5

WRENN, C. G., and HUMBLER, W. J., "Study Habits Associated with High and Low Scholarship". J. Educ. Psychol., (1941), 32:611-616.

Purpose:

This study was undertaken to validate items from the Wrenn Study Habits Inventory on a new population and to determine the extent to which these study habit items were valid for women as well as for men, since the inventory was originally standardized on men only, and also to test the validity of several additional items.

Subjects:

Twenty-four pairs of women and twenty-six pairs of men at the University of Minnesota served as subjects. One member of each pair was in the lower 40% of his class and was considered to be unsuccessful while the other was in the upper 20% of his class and considered to be successful. They were paired on the following variables: (a) scores within one probable error on the ACE Psychological Examination, (b) sex, (c) the same major pattern of course work (d) within two credits of the same academic load, (e) within one quarter of the same length of academic experience, and (f) no systematic training in study habits.

Procedure:

The subjects were administered an inventory of 71 items (25 from the Wrenn Inventory and 46 new items). He was to mark whether he rarely, sometimes, or frequently practiced that particular study habit. The results were tabulated by determining the precentage of students from high and low scholarship who responded to each item on the check list. An item was considered to discriminate if in any one of the three response columns the difference in the percentage of responses between the two groups was at least twice the standard error of the difference.

Results:

1. Twenty-seven of the items (20 from the Wrenn Inventory) were found to be significant for men. The largest share of these items were concerned with examinations, distribution of time, sociability and concentration.

2. Eleven of the items (all from the Wrenn Inventory) were significant for women.

3. Successful women more than successful men used a typewriter for written reports, participated in class discussions, and robbed sleep time for study.

Conclusions:

1. Use of the Wrenn Study Habits Inventory (in the original form) with women is hazardous since sex differences have been incorporated into the key.

2. The inability of the investigation to reveal many habits differentiating high and low scholarship women indicates that, insofar as these items are concerned, women are less variable in study skills than men.

BENT, R. K., "Scholastic Records of Non-High School Graduates Entering the University of Arkansas", J. Educ. Res., (1946), 40:108-115.

Purpose:

This study was undertaken to answer the question: "Can colleges and universities accept some mature students who are not high-school graduates with a reasonable degree of assurance that they will succeed?"

Procedure:

The college records of 54 students who had entered the University of Arkansas between the years of 1923 and 1943 and who had not graduated from high school were examined. These students were admitted provisionally upon passing a college aptitude test, a test of English proficiency, and any other tests prescribed by their departments. Their ages upon entrance ranged from 18 to past 40 with an average of 24.5 years. Forty-five were men and nine were women. The number of high school units ranged from 0 (24 students) to 15 (3 students).

Findings:

1. The average length of time spent at the university was 3.9 semesters with an average of 53.8 credits earned.
2. Ten or 18.5% of the 54 graduated, compared with 20% of the regular freshmen who graduate from the University of Arkansas.
3. Four of the ten graduated with honors, and one was a member of Phi Beta Kappa.
4. The average cumulative GPA was 2.48 as compared with a school average of 2.2.
5. All carried a normal load of 16 hours.
6. There was little relationship between the age at time of entrance and the length of stay in school, r = .15.
7. The correlation between age at time of entrance and GPA was .42.
8. The correlation between quartile ranking on intelligence tests was .63 and between GPA and length of stay in school .35.
9. There was no significant difference between the GPA's of the 24 students who had no high school credits and the other 30 with some high school, but their average was .27 points higher than those of regular students.
10. Six of the 10 students who graduated had no high school credits and four of these ranked in the lowest fourth on the intelligence tests.

Conclusion:

In many cases, college success does not depend upon the completion of high school or on high school attendance. In the absence of a scholastic record, ability to do college work can be predetermined on the basis of maturity, intelligence and English test scores, an interview, and other factors pertaining to adjustment about as well as it can be judged from a high school transcript.

I-A-6

BOU, I. R., and STOVALL, F. L., "A Study of High School Academic Indices as a Criterion for College Admission", J. Educ. Psychol., (1950), 41:309-320.

Purpose:

This study was undertaken to evaluate the high school academic record as a criterion for admission to the University of Puerto Rico and to determine the relative importance of letter grade averages given by the teachers of the various high schools of the island.

Procedure:

The university and high school GPA's of 2600 students at the University of Puerto Rico and the Polytechnic Institute were obtained. These averages were then compared and a coefficient of correlation computed. A regression equation was worked out by means of which GPA's were predicted from high school averages. The predicted grades were then compared directly with the grades actually made at the University and the extreme variations noted. An attempt was made to relate these extreme cases to particular high schools by determining the average difference between predicted and achieved grades of students from each high school represented.

Results:

1. The coefficients of correlation between high school and college grades ranged from .51 to .70. The correlation for the Polytechnic Institute was .54. The correlation for the total sample was .57.

2. When the differences between predicted and achieved grades were compared for the different high schools, it was found that the students from the largest high schools and the majority of the private schools, on the whole, make better grades than predicted for them on the basis of the regression equation. Students from the smaller public schools, more often, did not attain the level expected of them.

Conclusions:

1. The high school average is not very reliable as a criterion for selecting college students.

2. There is a positive relationship between high school and college grades but the degree of correlation is so low that high school grades cannot be used for predicting accurately college grades. The errors of estimate are high.

3. Students applying for admission to college who have the same high school averages do not necessarily possess the same degree of training and preparation for college work.

4. Students in general from the large high schools (500 or more students) make higher grades in college than do students from small high schools (300 or less students) with the same high school grade averages.

Implication:

When high school grades are used as the sole criterion for admission to college, a grave injustice may be done to students from large high schools with grades slightly below those required for admission. They may be, in many instances, better prepared than students from small high schools with grade averages a few points higher who are admitted to college.

I-A-6

CHARLES, D. C., "College Performance of Top-Quarter High School Graduates", Thesis, University of Nebraska, (1947).

Purpose:

The purpose of this study was to describe the performance of students who ranked in the top one-fourth of their high school graduating class.

Subjects:

A sample of 300 students, who ranked in the top one-fourth of their class, was drawn from the groups entering the University of Nebraska for the fall terms of 1941, 42, and 43. The sample was considered to be representative of the entire top-quarter group, although there were more women than men.

Procedure:

Academic records, for each student, were obtained from school records which included pre-registration guidance test scores, the total number of hours and grades for each year of residence, together with grades earned in mathematics, English, science and modern language. Also information concerning high school rank and high school graduating class size was obtained.

This information was classified and grouped to determine student characteristics according to high school class size, ability, number of hours carried per year, grades, drop outs, and honors attained.

Findings:

1. Almost two-thirds of the students were from high school graduation classes smaller than 50.
2. They were above the University average in terms of ability at the time of entrance.
3. They generally carried less than 30 hours per year.
4. Their grades were slightly higher than the University average.
5. Only one-third of the subjects dropped out.
6. They took somewhat more than their numerical proportion of honors as students.

CRAWFORD, A. B., "Forecasting Freshman Achievement", School and Society, (1930), 31:125-132.

Purpose:

The purpose of this study was to develop a means of combining various predictors of academic achievement into a single objective measure giving proper weight to all of them, so as to predict as accurately as possible the level of achievement to be expected of each student during his freshman year at Yale University.

Procedure:

The following data were obtained for each member of the class of 1930: (1) College Entrance Examination Board (CEEB) scores; (2) Scholastic Aptitude Test (SAT) scores; (3) adjusted high school rank; and (4) freshman GPA's. Product-moment correlations were then computed between various combinations and for two classifications of students (Plan A students for students of normal ability and Plan B for students of exceptional ability).

In a second part of the study, the same information was collected for the classes of 1932 and 1933 and product-moment correlations were computed. In additon a multiple correlation equation was developed using all three variables to predict GPA.

In the final part of the study the multiple correlations were used to identify students of outstanding ability. The number of these students who achieved at or above their predicted level was then obtained.

Results:

1. Correlations with freshman grades were:

| | | 1930 | 1932 | 1933 |
|---|---|---|---|---|
| CEEB | Plan A | .54 | -- | .64 |
| | Plan B | .42 | -- | .44 |
| HSR | Plan A | .60 | -- | .66 |
| | Plan B | .55 | -- | .53 |
| SAT | Plan A | .46 | -- | .40 |
| | Plan B | .49 | -- | .47 |
| Multiple R (Total) | | | .68 | .74 |

2. Twenty-five of the 39 predicted honor students attained the distinction of ranking scholar. There were no honor students who were not included in the predicted group.

Conclusion:

1. Scholastic Potentialities of entering Yale freshmen are effectively predicted from a weighted combination of various pre-matriculation data.
2. These predictions can be used effectively for the identification of potential honor students.

I-A-6

DWYER, P. S., "Some Suggestions Concerning the Relationship Existing Between Size of High School and Success in College", J. Educ. Res., (1938), 32:271-281.

Purpose:

To review the literature concerning the relationship that existed between high school size and college success and to extract from the reports of previous studies that information which seemed to have been found "quite universally true".

Summary:

The group relationships that existed between size of high school attended and college success were characterized by:

1. A positive correlation coefficient of high school size with first semester record of not more than .25.

2. A correlation coefficient between high school size and scholastic record which decreases as the student progresses through college and which became insignificant by the end of these two or three years.

3. A larger percentage elimination of students from small schools than of students from large schools in the first and immediately following semesters.

4. The relative scholastic equivalence of all groups in the later college years.

EURICH, A. C., "College Failures", School and Society, (1933), 37:692-696.

Purpose:

This study was designed to determine some of the academic characteristics of college failures.

Procedure:

A college failure was defined as a student who had failed three or more courses, or who had failed the same course twice. The records of all students registered during the fall term of 1930 in the College of Science, Literature and the Arts or in the College of Education at the University of Minnesota were examined and the college failures were identified. The percent of students who had failed three or more courses was determined for each class. The percentage was determined for each college. The percentages of students who had failed the same course twice were compiled in the same manner. Finally, to get an indication of the failure's ability, their mean percentile rank on the College Ability Test (CAT), high school scholarship and the college aptitude rating (a combination of CAT and high school scholarship) was determined.

Results:

1. Within the College of Science, Literature and the Arts, only a small proportion of the failing students reach the junior and senior year. Of the students who failed three or more courses 92.6% were freshmen and sophomores. This trend is not as definite in the College of Education where the results were confused by a large number of transfer students.

2. The same pattern was true for students who had failed the same course twice.

3. There was a general tendency for failing students to rank lower than average on the CAT, high school scholarship and college aptitude rating. The medians for the Science and Arts failures were: CAT 44; high school scholarship 42; and college aptitude rating 42. For the Education failures the medians were: CAT 24; high school scholarship 35; and college aptitude rating 32.

4. The honor point ratios of the failures were relatively low, indicating inferior scholarship in general.

Conclusions:

1. College failures are usually below average students with below average ability.

2. There is very little chance that students who fail three or more courses will ever graduate from college.

I-A-6

McMURTREY, G. W., "The Study of the Relationship Between Some Factors Which Affect School Work", J. Educ. Psychol., (1932), 23:553-558.

Purpose:

This study was conducted to determine the relationship between the intelligence of college students and seven other factors: (1) marks, (2) teachers' judgment of their intelligence, (3) their judgement of one anothers' intelligence, (4) their attendance at movies, (5) their attendance at dances, (6) their having dates, and (7) their earning of their own expenses while in college.

Method:

A list of students known to be either of very high intelligence, or of relatively low intelligence was compiled, and listed alphabetically. This list was sent to each of 65 students whose names were on the list, plus to 48 members of the faculty, with instructions to rate everyone known to them on the list according to estimated IQ. After this was received, a questionnaire was sent to each student pertaining to expenses earned, athletic participation, dates, dances, and movie attendance. Each student was given an Otis S-A test. Grades earned by the students were changed into numerical terms taking grades and total credit hours into consideration.

Results:

The results of this test showed a correlation of .51 between IQ and college marks, .58 between IQ and faculty estimate of IQ, .59 between IQ and student estimate of IQ and .71 between faculty estimate of IQ and marks. The close correlation between marks and faculty estimate of IQ is probably because the IQ estimate was influenced by the work handed into the faculty, which of course influenced the grades. Nonworkers had lower IQ's than those students who earned part of their expenses. The nonathlete had both higher IQ and higher scholastic standing. The "dancers" also had a higher IQ than the nondancers, but only a slightly higher scholastic standing. Nondancers earned more expenses. Movie attenders were slightly lower in intelligence, but higher in school standing than those who attended less movies. However, those who attended the least movies earned a greater percentage of expenses. Students who dated had a lower IQ, a higher scholastic standing, and earned almost twice as much expense as the nondaters.

I-A-6 also I-A-5 and I-A-3

McQUARY, J. P., "Some Relationships Between Nonintellectual Characteristics and Academic Achievement", J. Educ. Psychol., (1953), 44:215-228.

Purpose:

The purpose of this investigation was to determine the factor pattern underlying variables (intellectual and nonintellectual) assumed to be related to scholastic achievement. Two hypotheses were tested: (1) achievement in college is significantly related to certain non-intellectual variables; and (2) the non-intellectual variables can be grouped into several factors.

Subjects:

The subjects for the study were 174 male, first-semester freshmen at the University of Wisconsin who had sought counseling.

Procedure:

Information was obtained for each subject on each of the following variables: (1) scores on the ACE Psychological Examination forms Q and L; (2) Cooperative English Test scores on speed of reading level of comprehension and vocabulary; (3) high school rank; (4) occupation level of father; (5) size of community; (6) educational level of parents; (7) number of and position among siblings; (8) high school extra-curricular participation; (9) number of illnesses; (10) hours studied per week; (11) type of financial support; (12) number of credits carried; (13) GPA; (14) social extroversion-introversion; (15) mother's age at son's birth; (16) vocational certainty; (17) foreign born parent; and (18) veteran or non-veteran.

Distributions for each variable were converted to standard scores and then intercorrelated. The variables were then subjected to factor analysis by the multiple group method.

Findings:

Seven factors were identified. They were:

1. Factor C - Academic Performance predictor. Contained every intellectual variable (ACE, etc.) used in the study.
2. Factor B - Social-Class Intelligence. Contained ACE scores and educational level of parents.
3. Factor D - Participating Urban Scholar. Contained high school rank, size of community, extra-curricular participation and GPA.
4. Factor E - Social Introversion-Extroversion. Correlated highly with introversion-extroversion, foreign born parent and extra-curricular participation.
5. Factor F - Academic and Financial Security. Correlated with father's occupation, size of family, and hours studied per week.
6. Factor G - Introvertive Reader. Characterized by high linguistic ability, uncertainty of vocational choice, social introversion, and poor health history.
7. Factor A - was not discussed.

Conclusions:

1. Two factors (C and D) are necessary to account for the correlation of GPA with other variables.
2. The social extroversion factor appears to support the social I.E. scale of the MMPI as on index of participation in activities.

I-A-6

**MOORE, E. J.**, "Influence of Size of High School on the Relation of Rank in Graduating Class to College Achievement", M. A. Thesis, University of Nebraska, (1954).

Purpose:

To study the effectiveness of rank in high school graduating class as a predictor of first semester achievement in college, and to determine the influence of the size of the graduating class on the effectiveness of class rank as a predictor of college achievement.

Procedure:

A selection of 400 students was made on the basis of the size of the high school graduating class. This selection resulted in four groups of 100 students each. Each student's score on the American Council on Education Psychological Examination form "L" (ACE "L") and his score on the Nebraska English Placement was obtained from the school records. A statistical procedure was used to normalize the class ranks in order to accommodate for the difference in the class sizes. Separate statistical analyses were carried out for each group.

Findings:

When the variables were correlated with the criterion, it was found that rank in class correlated highest, although the correlations between the other variables and the criterion were significant.

Conclusions:

Class rank was a significant prediction variable for predicting freshmen first semester grade averages regardless of the size of the graduation class. It was a more effective predictor than either of the other two variables used together or independently.

Prediction based on class rank was more effective for students from classes larger than 50 then for those from classes smaller than 50.

I-A-6

READ, C. B., "Effect of Time Between High School and College", J. Higher Educ., (1941), 12:388-390.

Purpose:

This study was designed to answer the question: "Are the scholastic students who enter college directly from high school significantly different from the records of those who graduated from high school one or more years before entering college?"

Subjects:

One-thousand-five-hundred-eighteen freshmen at the University of Wichita in the years 1936-1939 served as subjects. Of these, 1320 entered college directly from high school and 198 had waited one or more years before entering.

Procedure:

To determine if there was any significant difference in the scholastic performance of the two groups, their average grades (both first and second semesters) were determined and a test of significance was applied. Next, in order to control any selective variables which might be acting in the two groups, each student who had waited one or more years before entering college was paired with a student who had entered directly from high school They were paired on the basis of scores on the Ohio State Psychological Examination and high school grade averages. The grade averages of the two groups were then compared.

Results:

1. There was no significant difference in the grade averages of the two groups (including all students) for the first and second semesters.

2. There was no significant difference in the grade averages of the paired groups for the first and second semester.

Conclusion:

There is no evidence that one or more years intervening between high school and college has any effect on the scholastic record of these freshmen.

I-A-6

SMITH, M. E., "The Effect of Bilingual Background on College Aptitude and Grade Point Ratios Earned by Students at the University of Hawaii", J. Educ. Psychol., (1942), 35:356-363.

Purpose:

This study was designed to investigate the effect of a bilingual background on the scholastic aptitude test scores and the grade point ratios (GPR) of students at the University of Hawaii.

Subjects:

The subjects were 364 students from bilingual backgrounds (Japanese, Koreans, Chinese, Hawaiian and Caucasians).

Procedure:

All subjects were given an adaptation of Hoffman's Bilingual Inventory (HBI) to measure the extent of the bilingual background. Scores were also obtained for each subject on the ACE Psychological Examination. The mean score of each race group represented and for all subjects was computed. The critical ratios of the difference between the HBI and ACE scores and the GPR were then computed for the original group of 364 subjects. Zero order correlations were computed between the HBI and ACE, the HBI and GPR and ACE and GPR for all of the subjects (who were at the University for one semester) and for the Japanese and Chinese students who remained for three quarters. Multiple correlations were also made correlating HBI and ACE with GPR, HBI and GPR with ACE, and CA and GPR with HBI for the same groups of subjects.

Results:

1. On the ACE, Caucasians ranked first, Chinese and Japanese groups next and the Hawaiians and Koreans last. The mean scores of the Hawaiians and Koreans were significantly lower than the scores of the Caucausians.

2. The least English was spoken in the Japanese homes, then in the Korean, Chinese, Hawaiian and Caucausian.

3. The mean GPR's were highest for the Japanese, next for Caucausian and Chinese, with Hawaiian and Koreans last.

4. Very low correlations (.044 to -.200) were found between HBI and ACE scores.

5. Correlations ranging from .31 to .76 were found between ACE scores and GPR.

6. Correlations ranging from -.013 to .431 were found between GPR and HBI.

7. Correlations for students who had completed three semesters were not significantly different than those based on one semester's work.

8. The multiple correlations were not significantly different than the zero order correlations.

Conclusions:

It would appear that bilingual background affects the college entrance examination scores at the University of Hawaii much more than it does their achievement after entrance as measured by GPR.

Discussion:

Bilingual background does not appear to be a significant factor in the prediction of academic achievement.

I-A-6

STARLIN, G., and LALLAS, J. E., "Inter-institutional teaching by television in the Oregon State system of higher education", Oregon State System of Higher Education, (1960); (1962). Report No. One, 1957-1959 and Report No. Two, 1959-1961.

Purpose:
To determine the feasibility of inter-institutional teaching by television.

Setting:
Fourteen regular college credit courses were taught according to four variations in television methodology to approximately 10,400 students in four Oregon institutions of high education over a period of six years. Teaching sessions of each course originated on one of four campuses and were received simultaneously, by open-circuit telecast from educational TV station KOAC, Corvallis, Oregon, in classrooms on all four campuses. TV instruction was generally supplemented by face-to-face instruction in the classrooms, but for some subjects TV was used as the total teaching medium. The variables in teaching methods were (1) total TV teaching, (2) TV teaching with supplementary face-to-face teaching, (3) guest speakers in classrooms plus TV teaching, and (4) TV teaching with team-taught face-to-face supplementary sessions.

Variables were controlled by constructing achievement tests of the TV-taught material only. Achievement comparisons were accomplished by comparing scores on the tests by analysis of variance, analysis of covariance with adjustment for scores on the Minnesota Scholastic Aptitude Test, and "t" test techniques. Student and faculty attitudes were determined by interviews, questionnaires, attitude inventories, and controlled observations.

Conclusions for 1957-59 period:
In the first report, the authors found no significant differences between the methods of instruction. There was some evidence that students on the originating campus did somewhat better than the students on the receiving campuses for the same course, but this effect was not borne out in the second report. (See the next section.) Student attitudes toward TV as a means of instruction are based on the same factors of like and dislike which determine attitudes in face-to-face classes. Students accept instruction from teachers on other campuses as well as teachers from their own campuses. Full-time faculty members disliked assignment to supervising duty in TV-receiving classrooms and graduate students were found able to perform the supervising duty well.

Conclusions for the 1959-61 period:
During the first period there was some indication that students on the originating campus did better in terms of achievement than students on the receiving campuses. The authors felt, if such a difference did in fact exist, it might be due to a number of factors, including greater accessibility of the TV teacher to students, an ability developed through contact with the teacher by students to predict examination questions, increased student motivation from contact with TV teacher, and greater student familiarity with the examination policies and procedures on the originating campus

originating campus. Using analysis of variance and analysis of covariance techniques with a control for year in school, sex, and academic ability, these hypotheses were subjected to intensive investigation during the 1959-61 period and were reported in the second report.

From the extensive study, the preponderant conclusion obtained was that the institutional origin does not affect student achievement. The differences favoring the students on the originating campuses appear to be due to chance and not the method of instruction. Several of the differences were found in the fall semester and disappeared in the spring semester. The authors attribute this to a lack of familiarity with the method of instruction. The difference in achievement between freshmen and upperclassmen was found to be significant in a number of cases for all methods of instruction and the authors point out that this difference appears to be as important as individual differences in ability.

General conclusions:

From the six years of study, the authors conclude that students on all campuses learned equally well when taught by television from one campus. Students also learned as well when taught by television as when taught by face-to-face methods.

I-A-6

TEAHAN, J. E., "Parental Attitudes and College Success", J. Educ. Psychol., (1962-63), 53-54:104-109.

Purpose:

To investigate the attitudes of college high and low achievers and their parents.

Method:

Subjects consisted of two groups of college freshmen (46 females and 44 males) and their fathers and mothers. All students had a history of academic excellence in high school (upper 20%) and high scores on the College Qualification test upon entering the University. The low achievers were 23 females and 22 males who were matched on CQT scores and father's occupation with the first group and who had a 2.0 GPA.

The parental attitude scale used in this study was constructed of 45 items taken from the Parental Attitude Survey devised by Shoben. There were 3 subscales, the Possessive (P), Dominating (D) and Ignoring Scale (I). The student, his mother and father were all asked to rate each item on a five-point scale from SA to SD.

Results:

No significant differences were found in the child-rearing attitudes of high and low achieving female students. However, there was a significant difference between the attitudes of mothers and their daughters in the low-achieving group. Mothers of low achievers were more dominating than their daughters while no such disparity was found among high achievers. The fathers of both female groups were similar in the sense that they were significantly higher than their daughters on the D and P scales. The fathers and mothers of high females were significantly lower on I scale than the low achievers.

With the males, it was primarily fathers' attitudes which appeared to set the two groups apart. Fathers of low achievers were significantly higher than their sons on the P and I scales while no such differences appeared when the high achievers and their fathers were compared. Fathers of high achievers were also significantly lower on P scale than fathers of low achievers.

Only in the case of high achievers did a difference appear between sons and mothers, with the latter having a significantly lower score than their offspring on I scale.

Discussion:

The disparity seen in the present study between low achievers and their mothers and fathers could be interpreted as meaning that these students have not been allowed to develop the self-sufficiency and independence of thought necessary for college success.

I-A-6

THORNBURG, L. H., "College Scholarship and Size of High School", School and Society, (1924), 20:189-192.

Purpose:

To determine the efficiency of college students as conditioned by the size of the high school from which they come.

Procedure:

Grades were tabulated by size of high school for those students who entered the State College of Washington as freshmen in September of 1921 (N = 476) and 1922 (N = 579). A point system was used in which A = 3 points, B = 2, C = 1 and K = 0. For the 1922 group, grades covering two semesters were used and for the 1921 group, grades covering four semesters were used. Only those students' records were included which were complete for the two or the four semesters. High schools were considered in the following groups: those having an enrollment from 1-50, 51-100, 101-200, 201-300, 391-500, 500-1000, and 1001 and over. The average number of semester hours of A, B, C, K grades and the average number of points earned by the students who had done their prep work in the different sized high schools were computed.

Comparison was made of the women's scholarship with that of the men's. The age of college entrance along with the average number of points accumulated by each age group was also computed.

Results:

Students from large high schools were superior in scholarship in college to those coming from small high schools. In general, scholarship increased with the size of the high school, although the increments were not regular. Students coming from high schools with enrollments of fewer than 100 students and students from high schools with an enrollment of more than 100 students showed the most marked difference in the quality of college work.

Students who entered college at the normal age or a year younger did the best work and were found (as judged by the Alpha test) to be of superior native endowment. The reverse was found true of students who entered a year or two later than the normal age. "Women surpassed men in scholarship by every comparison." The women were a more highly selected group (as judged by intelligence scores).

I-A-6

VAN CAMP, B. J., "Scholastic Achievement of Teachers College Students in Selected Courses", M. A. Thesis, University of Nebraska, (1956).

Purpose:

This study was undertaken to find if students enrolled in Teachers College at the University of Nebraska and students enrolled in other colleges differ in their achievement in selected courses.

Procedure:

From records of students at the University of Nebraska who had entered as freshmen in September of 1952 and completed six full semesters, selection of students from each college who had attended each course was made. Nineteen courses, in which students from at least several colleges had been enrolled, were selected. Final course grades of the 4776 students were used as the basis of comparison. Single classification analysis of variance was used to detect significant differences in achievement of the students of various colleges in the selected courses. The colleges represented were Agriculture, Business Administration, Engineering and Architecture, Junior Division, Pharmacy, Arts and Sciences, and Teachers. Courses selected by which to compare colleges were English - B, English - 1, English - 3, Business English, Introductory Literature, Ethics, Fundamentals of Speech, Public Speaking, History of Europe before 1500, History of America Before 1865, American National Government, State and Local Government, Principles of Economics, Introductory Sociology, Psychology of Personality, General Biology, College Algebra, Introductory Accounting, and Business Law.

Results:

Of the 19 courses, significant differences were found in nine. Teachers College students were not among the groups ranked poorly in any of these cases. The Colleges of Agriculture and Engineering and Architecture were in the lower groups four times, the Colleges of Business Administration, and Junior Division were lower three times, and the College of Arts and Sciences was lower once.

A count showed the Colleges of Agriculture and Pharmacy in the higher group once, Junior Division higher three times, and the College of Arts and Sciences and Teachers College were higher six times each. Comparison of each colleges' mean achievement in each course with the grand mean in that course showed the Teachers College mean below the grand mean once, the Arts and Sciences College below the grand mean six times and the other Colleges below in about half of the cases.

Conclusions:

In the selected courses the level of achievement of Teachers College students was equivalent to or better than the level of achievement of students enrolled in other colleges of the University.

DURFLINGER, G. W., "The Prediction of College Success--A Summary of Recent Findings", J. Amer. Assoc. Collegiate Registrars, (1943), 19:68-78.

Purpose:

This article presents a review of the literature on the prediction of college success from 1934-1943. Studies are classified according to the predictive variables used.

Procedure:

Findings using intelligence test scores:

1. The median of the 47 correlations reported is .52. They range from .30 to .72. In most schools the correlation between intelligence or college grades is between .40 and .50.
2. Intelligence tests vary among themselves in their ability to predict college grades. The test which is the best predictor for one college may not make a significant contribution in the prediction of grades in another school.

Findings using achievement test scores:

1. The median correlation of the reported correlations between achievement test scores and grades is .475. The correlations range from .34 to .63.
2. Achievement test scores appear to be about as predictive of college success as intelligence test scores.
3. Ryans found a correlation of .48 between persistence and drive and grades.
4. The lack of adequate personality tests hinders research in this area.

Findings using high school grade averages:

1. High school grades generally provide as accurate a basis for predicting college scholarship as any other single criterion.
2. Correlations between high school and college grades generally vary from .50 to .60 with a median of .55.

Findings using combinations of variables:

1. The multiple correlations reported between 1934 and 1943 range from .54 to .83 with the median somewhere between .60 and .70.
2. Multiple correlation coefficients are rarely higher than .80 regardless of the variables used.
3. An intelligence test, a good achievement test and high school averages together usually give the highest multiple correlations.

Findings taking the sex differential into account:

1. Correlations between the various variables and grade averages are often significantly different when correlations are computed separately for the two sexes.
2. Better prediction is usually achieved when separate prediction equations are used for each sex.

I-B-1 also I-B-4

**ANDERSON, F., Jr.**, "Predicting Success in Nurses Training", M. A. Thesis, University of Nebraska, (1949).

Purpose:

The purpose of this study was to determine the relationship of personality adjustment as measured by the Minnesota Multi-Phasic Personality Inventory to success in nurses' training, and to summarize the results of a testing program consisting of the Kuder Preference Record, Otis Q-S Gamma Test of Mental Ability, George Washington University Nursing Aptitude Test and their correlation to performance ratings as estimated and given by the instructor.

Procedure:

The four tests mentioned above were administered to 50 nursing students upon completion of their first year of study at a midwestern nursing school. All tests were administered in a 4½ hour testing session. Estimated performance of the students was broken into four areas: academic achievement, personality adjustment, present nursing ability, and future nursing ability. These factors were graded on a five-point scale with A the highest and E the lowest.

Results:

The scores on the Otis Test ranged from 29 to 127 IQ, with a mean score of 107. The scores on the George Washington test were negatively skewed showing the tendency toward higher scores. The coefficient of correlation between these two tests was .59. The profile from the Kuder Preference Record was very similar to the profile for 826 nurses in the original Kuder group. When the instructors' ratings and the 9 areas of the MMPI were correlated, not one coefficient was significant even at the 5% level. When the MMPI results were compared with the average woman in college, the nurses were more masculine in interest, and showed less emotion.

Conclusions:

In this study there was no significant correlation between personaltiy adjustment as rated by the instructors and scores on the MMPI. There was a very high correlation among the four areas as rated by the instructors, however, which may indicate the instructors' ratings of personality adjustment was based on the student's ability to conform to school regulations. No attempt was made to correlate the instructors' ratings with actual success on job. Intelligence as measured by the Otis Test was not highly significant in the prediction of academic success. Interest in Social Service was highest on the Kuder Preference Record.

I-B-1

HEWER, Vivian H., "A Comparison of Successful and Unsuccessful Students in the Medical School of the University of Minnesota", J. Applied Psychol., (1956), 40:164-168.

Purpose:

To give some assistance in evaluating current medical school procedures of selection of students by comparing the scores made on tests by a group of successful and unsuccessful medical students at the University of Minnesota.

Subjects:

The successful group was composed of those students who had either completed one or two years of medical school (N = 255). The unsuccessful group (N = 29) was composed of all male students who were dropped from medical school because of scholastic failure during 1949-1953.

Procedure:

Three approaches to the analysis of test results were used: (1) Tests were applied to determine whether a significant difference existed between the mean scores made by the two groups on a variety of tests. The following variables were tested: (a) high school rank (b) total premedical honor point ratio (grades earned in all courses taken in premedical training) (c) science premedical honor point ratio (grades earned in all required science courses) (d) American Council on Educational Psychology Exam (college aptitude test) (e) Cooperative English Test (English achievement) (f) Professional Aptitude Test (PAT), (g) Minnesota Medical Aptitude Test, (h) Strong Vocational Interest Blank (SVIB) (i) Minnesota Mulitphasic Personality Inventory. (2) The application of the chi-square test to the frequencies within the two groups of the occurrence of patternings of evaluation of MMPI scales (code numbers were attached to the two scales with the highest score regardless of degree of evaluation. The codes were then tallied (tallying each scale) and the chi-square test applied to the frequencies. (3) SVIB and MMPI profiles were prepared on successful and unsuccessful students. Three judges sorted SVIB profiles into two groups on the basis of those that would or would not be recommended for acceptance in medical school.

MMPI profiles were sorted by two clinical psychologists into three groups (accept, reject, and hold) with regard to recommendation for medical school. Chi-square tests were then applied to determine whether judges could identify the successful and unsuccessful students through blind sort of test profiles.

Results and Conclusions:

1. Successful medical students made significantly higher grades (.01 level) in their premedical courses than did unsuccessful medical students.

2. Successful medical students made significantly higher scores (.01 level) on the Minnesota Medical Aptitude Test and on ACE (.05) level than did unsuccessful students.

3. Unsuccessful medical students had a significantly higher score (.05 level) on the L scale of the MMPI. This suggested a defensiveness of response or low psychological maturity.
4. It was suggested (chi-square $.10 > p > .05$) that the general personality organization, as measured by the MMPI, may be different for successful and unsuccessful students.
5. Experienced psychologists were unable to identify successful or unsuccessful medical students through the use of either SVIB or MMPI profiles.

I-B-1

JOURARD, S. M., "Self-Disclosure Scores and Grades in Nursing College", J. Applied Psychol., (1961), 45, 4:244-247.

Purpose:

In some educational programs interpersonal aspects of students as well as intellectual aspects are considered important. Consequently the interpersonal aspects are taken into account when assigning grades. For instance, nursing students are judged partly on the basis of their mastery of subject matter and also on the degree to which they have mastered manual and interpersonal skills. The present study was undertaken to determine whether a measure of one aspect of nursing students interpersonal behavior, their self-disclosure to parents and peers, when obtained early in the students' careers, would predict their grade point averages at the conclusion of the program.

Procedure:

The method employed to measure self-disclosure consisted of 25 items, each of which asked the subject the extent to which certain people knew certain things about her because she had told them. The people referred to were the subject's mother, father, closest male friend, and closest female friend. The areas asked about ranged from hobbies to health. If the person in question was fully informed about the subject, in the area of hobbies, for instance, the subject indicated so by putting the number one in the appropriate place on an answer sheet. If the person was not fully informed, this was indicated with a zero. The answer sheet had 25 rows and four columns headed respectively, Mother, Father, Closest Male Friend, and Closest Female Friend. Hence, each question was answered by each of the four persons.

The questionnaire was administered to 46 sophomore nurses at the University of Florida, College of Nursing. Median age of the group was 20. By completion of their senior year, 23 of the subjects were left for the analysis. Grade point averages for (a) all nursing courses during 4 years, (b) nursing courses during junior and senior years, (c) all non-nursing courses during 4 years, and (d) all coursed combined, were obtained on each subject. Product-moment correlations were calculated between these grade point averages and self-disclosure scores from two years earlier.

Results:

Significant correlations were found between total self-disclosure score and the three GPA's in which nursing courses were included. The highest correlations were found between GPA's with nursing courses and self-disclosure to Mother (.70 to .78). Next highest were between GPA's with nursing courses and self-disclosure to Female Friend (.53 to .62). Correlations between GPA's with nursing courses and self-disclosure to Father were also significant (.44 to .46 P = .05, N = 23) but were not between nursing courses and disclosure to Male Friend.

Conclusions:

The self-disclosure scores may be presumed to reflect the degree to which the subjects actually engaged in self-revealing communication to others in their lives. The present findings suggest that this type of activity prepares a nursing student to engage in behavior which will earn her the highest grades in nursing college.

The high correlations between disclosure scores to Mother and grades in nursing courses implies that open communication with one's mother is good practice for communication with other female authority figures in nursing school.

That the self-disclosure scores are not indices of intelligence or general academic aptitude is indicated by an insignificant correlation of .07 found between score on the ACE Psychological Examination and total self-disclosure scores for a sample of 52 freshman nursing students. Moreover, the present study found insignificant correlations between grades in strictly academic courses and self-disclosure scores.

I-B-1

SCHOFIELD, W., "A Study of Medical Students with the MMPI, III, Personality and Academic Success", J. Applied Psychol., (1953), 37:47-52.

Purpose:

To identify relationships between MMPI profiles and academic success of medical students at the University of Minnesota.

Subjects:

Eighty-three male students who entered the University Medical School in 1946 were used in this study.

Procedure:

(1) MMPI profiles of 11 male freshman medical students (from the top and bottom quarters of their class and at the end of the junior year) were compared. Students from the upper and lower quarters of the class as measured by total honor point ratios were matched for scholastic aptitude as measured by the ACE. (2) The MMPI was also given during the junior year to study the relationship between amount of personality change between the freshman and junior years and scholastic achievement. (3) Students were also separated into two groups with members for each group matched for academic aptitude (ACE) but differentiated by the occurrence and nonoccurrence of high points on their profiles on the Hy, Pd, or Sc scales.

Results and Conclusions:

(1) Average profile comparison of the upper quarter students with the lower quarter showed that the Hy, Pd and Sc scales yielded significant differences. Low quarter students revealed a tendency toward greater neuroticism and defection in interpersonal and social relationships. (2) Top quarter students revealed a reliable change in mean score on three scales (Mf, Sc and Ma). The bottom quarter sample showed reliable freshmen-to-junior changes only in decrease in their Ma score. (3) The group having the high points on their profiles on the Hy, Pd, or Sc scales were clearly inferior in academic performance (HPR) to the group not showing these scales as high points. Ninety percent of the group with high points on the Hy, Pd or Sc had honor point ratios falling below the median HPR (1.75) of the group without these high points.

It appeared that "when academic aptitude is constant, the likelihood of achievement up to capacity in the medical curriculum becomes less when hysteroid, psychopathic and schizoid traits, measured by the MMPI, are greater."

I-B-1

THURSTON, J. R., BRUNCLIK, H. L., and FINN, P. A., "The Relationship of MMPI Scores to Personality and Achievement Levels of Student Nurses", J. Psychol. Studies, (1961), 12:75-85.

Purpose:

To evaluate the relationship between the MMPI and achievement in nursing education and to investigate the relationship between the MMPI and those factors of personality considered crucial to nursing.

Subjects:

Thirty-six students from Holy Family Hospital School of Nursing in Manitowoc, Wisconsin, fifty-four students from St. Mary's Hospital School of Nursing in Wausau, Wisconsin, and fifty-six students from Luther Hospital School of Nursing in Eau Claire, Wisconsin. All of the subjects were of junior or senior level and all of the participating schools conduct a three-year accredited nursing program.

Procedure:

Personality ratings for each subject were obtained from a Faculty Committee from each school. Each Faculty Committee consisted of five members of the faculty who had at least three months of personal knowledge concerning each student's performance. Ratings were made individually according to the following criteria:

1) dependability
2) tolerance
3) effective intelligence
4) social awareness
5) adaptability
6) cooperativeness
7) objectivity
8) ability and personality to teach
9) interpersonal relations

The mean of each student's five ratings constituted the student's personality rating for this study.

Cooperatively, each Faculty Committee classified each student as an "underachiever" (a student apparently not meeting her potential) or an "achiever" (a student apparently meeting her potential).

All subjects were administered the group form of the MMPI during the first three months of 1959.

Findings:

Standard MMPI score analysis - There was no significant differences on any of the scales for the two achievement groups at two of the schools. At the third school, the "underachiever" group obtained significantly higher Pd and Pa ($p = .05$) scales.

Profile analysis (Welsh, 1948 method) - There was no uniquely characteristic profile patterning for either achievement group.

I-B-4

KIRK, Barbara, GOODSTEIN, L. D., and CUMMINGS, R. W., "The Strong Vocational Interest Blank and Collegiate Nursing Education", Personnel Guid. J., (Sept, 1961 - May, 1962), 40:160-163.

Purpose:

To examine all of the occupational keys of the Womens SVIB (Strong Vocational Interest Blank) in relation to nursing success using an occupational criterion of success in addition to scholastic GPA in a collegiate school of nursing.

Method:

The SVIB for Women and the Otis Self-Administering Test of Mental Ability were available from an entrance testing program for three consecutive entering classes in a collegiate school of nursing. Over this period, 221 completed the SVIB. Of the 221, 178 graduated, 26 resigned because of personal reasons, and 17 resigned because of academic unsuitability. Of the 178 graduates, follow-up data which had been secured by questionnaires were available on 124.

Results:

For the 178 graduates, the highest mean occupational scores were on the Occupational Therapist, Nurse, and Office Worker keys. The withdrawal group's highest scores were the same. The withdrawal group was significantly higher on the Artist and Lawyer keys, while the group of graduates was higher on the Physical Education teacher key. Seventeen Strong profiles of the withdrawn group were matched on the basis of the Otis scores with a group of 17 profiles of girls who had completed training. These 34 profiles were judged by experts. None of the four judges were able to sort the profiles with much better than chance success as to probable success in nursing.

On the questionnaries, it was impossible to discover a group that had graduated from the program and had entered some new area of employment. A comparison of the mean Strong profiles of those 93 graduates still active in nursing with those of the 31 who entered some other field did not produce significant differences.

Conclusions:

Neither the Strong nor the Otis predicted withdrawals from the program for academic unsuitability, nor did either test predict GPA.

Discussion:

The GPA is a composite of grades in both classroom subjects and practical duties. The reliability of such composite grades is unquestionably low and this GPA is probably unpredictable.

MOTTO, J. J., "Interest Scores in Predicting Success in Vocational School Programs", Personnel and Guid. J., (1959), 37:674-676.

Purpose:

To test the hypothesis that students who successfully complete a vocational school program and find employment in the field for which they trained will have significantly higher Kuder Scientific and significantly lower Persuasive and Literary scores than will students who enter but fail to complete vocational school programs.

Method:

From an examination of school records, two groups of 40 were randomly selected: Those who completed the program and were placed, and those who failed to complete the program. About 70% of the student body of this school were disabled veterans and 65% were veterans.

The criterion "failed to complete the program of training" was elected because of the low incidence of discontinuance of training due to exacerbation of the disability or because of ill health.

Results:

This study is a follow-up on another abstract by Samuelson which was previously done. The previous findings that Kuder Mechanical was not related to performance in mechanical training programs were verified in the present study. The only marked difference between means was for the outdoor scale with subjects in this study earning significantly lower scores than was true of the Samuelson's group. On none of the scales did the two groups differ significantly.

Conclusions:

None of the Kuder Preference Record Scales significantly differentiated successful from unsuccessful vocational school trainees enrolled in 10 different programs of training. Vocational school trainees tended to produce a Kuder profile which was characterized by a flatness and an absence of scores which fall beyond the highest and lowest quartiles.

I-B-4

SAMUELSON, C. O., "Interest Scores in Predicting Success of Trade School Students", Personnel Guid. J., (1958), 36:538-541.

Purpose:

To determine the relationship between each of the various scales on the Kuder Preference Record and instructor judgment of student total performance in the instructional activities in several departments of a vocational school.

Method:

This study was made on 58 subjects in various departments who were enrolled full time in certain trade departments of the Sale Lake Area Vocational School during the academic year 1955-56. Accomplishment was defined in terms of student performance in all aspects of the instructional program. To make this judgment, each of the instructors accordingly ranked the students in his class from best to poorest on the basis of his estimate concerning each student's total performance in the instructional activities.

The rankings thus derived within the individual departments were then converted to percentile scores to allow combining all students into one group. After the data had been secured, the Pearson-Product Moment method of correlation was used to determine the simple relationship between the scores on the several Kuder scales and the student rankings obtained in the manner described above.

Results:

The scale showing the greatest interest strength, was the mechanical area. However, the mechanical scale was correlated with the criterion of student success to only a negligible degree. The Scientific Persuasive and Literary scales were correlated with the criterion of Accomplishment beyond the 1% level. The relationship between the Scientific scale and the criterion was positive, the relationships between the criterion and the Persuasive and Literary scales were negative, although of similar magnitude.

Conclusions:

It appears (within this study) that the relationships between certain interests as measured by the Kuder Preference Record (Scientific, Persuasive and Literary) and achievement as measured by class rankings are real since they are significant at the 1% level of confidence. However, since the highest correlation coefficient of 0.412 between the criterion and the Scientific area gives an index of forecasting efficiency of only 9%, these relationships seem to be of limited usefulness for predictive purposes. The pattern of interests shown by the Scientific, Persuasive, and Literary scales is the combination most closely related to the criterion and may merit further study as to its stability with other and larger vocational school groups.

I-C-1

AMES, Viola, "Factors Related to High School Achievement", J. Educ. Psychol., (1943), 34:229-236.

Purpose:

The purpose of this study was to isolate personality traits which may be related to achievement. Specifically, the study was designed to answer three questions: (1) How often is it possible for a student having an IQ below the mean of his class to achieve above the mean of his class? (2) Do certain personality ratings improve the prediction of scholastic achievement? (3) What are the factors being measured by the variables used in this study?

Subjects:

Three graduating classes of a midwestern high school were used as subjects for problem one and 237 of these were used for problems two and three.

Procedure and Findings:

Problem I: The IQ of each student was determined using the Otis S-A Intelligence Test. Each subject's IQ was then compared with the group mean and his four-year GPA was compared with the group average. The percent of the students with IQ's below the group mean and GPA's above the group mean was then determined. Fifteen percent of one class and between 12% and 14% of the other two classes were able to achieve grades above the mean of their class.

Problem II: Each subject was rated on a 36-trait personality rating scale by each teacher who had had him in class at the time of the study. The mean rating for each item was taken as an index of the trait for each student. Product-moment correlations were then computed between each trait and GPA. Several factors correlated significantly with achievement. They were: persistence (.60 ± .05), common sense (.52 ± .05), dependability, punctuality (.47 ± .05) cooperation (.45 ± .06), honesty (.41 ± .06) and sincerity. Persistence, common sense and dependability correlated about as highly with achievement as did intelligence (.54 ± .05). A multiple R of .72 was obtained by combining IQ and the significant variables. When IQ, persistence and attitude were the only variables used, the multiple R was .71.

Problem III: Using the Thurstone Centroid Method of Multiple Factor Analysis, the variables used in this study were factor-analyzed. Two factors were isolated. Factor I was related to the student's ability to succeed and was not correlated with achievement. Factor II measured the students tendency to conform to the school situation and was highly correlated with achievement.

Conclusions:

1. The fact that students with IQ's below the group can achieve grades above the group mean indicates that factors other than intelligence are operating in the prediction of academic success.
2. Much more accurate predictions of achievement can be made using personality ratings plus an intelligence score.
3. The ability to succeed socially has no relation to high school achievement.
4. The student's ability to conform to school situations is highly related to academic success.

I-C-1

**ANDERSON, K. E., and TILGHMAN, A.**, "Relationship of Self-Rating Items on Intellectual Curiosity and Persistence to National Merit Scholarship Test Scores", School and Society, (1960), 88:356-358.

Purpose:

To study non-academic correlates (viz. intellectual curiosity and persistence were related to standard test scores from the Merit Scholarship Qualification Test).

Procedure:

The subjects were 4,700 juniors in 300 high schools in Kansas who took the National Merit Scholarship Qualifying Test in April 1958. A year later the students were given a 4-point questionnaire prepared by the University of Knasas. The questionnaires consisted of four 5-point self-rating scale questions. They were:

1. intellectual curiosity
2. willingness to stand discomfort in completion of a school task
3. willingness to spend time beyond ordinary schedule
4. questioning the absolute truth

Results:

All of the F values were significantly at the one percent level which indicated a significant difference among the means of the five response groups for each of the four items. The five response groups were arranged according to results on the Merit Scholarship Test.

The results showed that for each of the four items on the questionnaire, each group scored significantly different on the Merit Scholarship Test, with the high above average group scoring the best and so on down for each of the other groups.

Conclusions:

If tendency to rate is the same as a possession of these traits (item 1 to 4), then these factors are seemingly carried over to some degree into achievement as measured by the National Merit Scholarship Test.

I-C-1 also I-C-4 and I-C-5

ECKERT, Ruth E., and MILLS, H. C., "Variations Among High School Seniors in Promise and Performance Measures", School Review, (1936), 44:274-282.

Purpose:

This study was designed to compare certain characteristics of students whose achievement was definitely above the level suggested by their scores on scholastic aptitude tests with those whose achievement was definitely below that suggested by the tests.

Procedure:

A group of overachievers (29 boys and 51 girls) and a group of underachievers (37 boys and 43 girls) were selected from a sample of 442 high school seniors on the basis of the opposites test of the ACE Psychology Examination and the average grade on the Regents Examination (RE). The ACE and RE scores were converted to standard scores. The difference between ACE and RE standard scores were determined for each student. By using Kelly's formula, it was found that 36% of the variations between ACE and RE were greater than chance would allow. The overachievers, then, were the 18% with the greatest variation in ACE and RE in favor of RE and the underachievers were the 18% with the greatest variation in favor of ACE.

The subjects were given various aptitude, interest, attitude and achievement tests which included: (1) the Iowa High School Content Examination (English and History), (2) Colgate Studiousness Index, (3) Neumann Test of International Attitudes, (4) Zyves Stanford Scientific Aptitude Test, and (5) The Willoughby revision of the Thurstone Personality Schedule. Each subject also filled out an extensive personal questionnaire. The results were analyzed by comparing the average scores of the two groups on each measure.

Results:

1. High school rank also gave as good a differentiation between the two groups as the criterion RE. Neither the Iowa Test nor the Stanford Scientific aptitude test were able to do this.
2. The overachievers were, on the average, five months younger than the underachievers.
3. The overachievers appeared to be more purposeful or more direct in their aims than the underachievers. They were more interested in courses that lead to academic degrees and more motivated to win scholarships to carry out their purpose. On the SVIB their interests more nearly followed those of people in the professions.
4. The parents of underachievers were foreign born more often than not. No other factors relating to the home were differentiating.
5. Overachievers had more efficient study habits.
6. Overachievers had more interest in science and mathematics.
7. None of the personality measures were differentiating.
8. The overachievers participated in more recreational activities and held positions of leadership.

I-C-1 also I-A-1

GOUGH, H. G., "A Non-intellectual Intelligence Test", J. Consult. Psychol., (1953), 17:242-246.

Purpose:

This study was undertaken "...to determine whether a criterion-specific set of personality inventory items could be assembled which would correlate significantly with accepted measures of intellect, and second, if this was successful, to determine whether the individual items could be combined in a scale which would have anything approaching practical significance and value."

Subjects:

Item selection - 441 senior students from 4 Minnesota high schools.

Cross validation - the first group consisted of 272 St. Cloud and Minneapolis ninth-graders, 231, 1947 twelfth-graders and 271, 1948 twelfth-graders (both of St. Cloud) and 40 University of California advanced graduates.

The second group was 30 University of California first-year graduates in Psychology. The revised scale group consisted of 461 Rock Island, Ill., and 230 Wellsville, N. Y., high school students, and 43 University of California undergraduate Psychology students.

Adjective Check List subjects were 40 graduate students at the University of California Institute of Personality Assessment and Research.

Procedure:

Seventy-six new and selected (from standard sources) items were identified as showing consistent and significant differences between the high (upper quartile) and low (lower quartile) students of four Minnesota high schools.

Of these 76 items, 59 were MMPI items and these were administered to the first group where criterion measures were conventional IQ measures for all except the graduates in which case the Miller Analogies Test was used. The second group was administered the full 76 items.

On the basis of the two graduate student samples, 24 of the 76 items were eliminated as only slight contributors; therefore, reducing the scale to 52 items which is the scale currently included in the California Psychological Inventory (39 items of the 52-item scale are MMPI items). This 52-item scale was then cross-validated on a new group of subjects where again the criterion was a conventional IQ measure.

The Adjective Check List group was given the 52-item scale and the staff of the Institute completed Gough Adjective Check Lists for each of the 40 students.

Findings:

For the 59 MMPI items, correlations ranged from .36 to .53. For the 76 items, a correlation of .44 was obtained. Correlations for the revised 52-item scale were:

| | | |
|---|---|---|
| Rock Island, Illinois | N 461 | r .49 |
| Wellsville, N. Y. | 230 | .50 |
| U. of Calif. Psych. Undergrad. | 43 | .42 |

For the Rock Island students, correlations between grade averages and the 52-item scales were: (a) for the females, .59, (b) for the males, .31. The correlations between tested IQ and grade averages were: (a) for the females, 156, (b) for the males, .51. The general trend of adjectives significantly differentiating between the ten highest and the ten lowest scores (of the 40 graduates) was: (a) for high scorers "capable, clear-thinking, dependable, logical, realistic, etc.", (b) for the low scorers "cynical, headstrong, impatient, and resentful."

I-C-1

GOUGH, H. G., "Factors Relating to the Academic Achievement of High School Students", J. Educ. Psychol., (1949), 40:65-78.

Purpose:

This study was undertaken to determine whether a set of items could be isolated from the MMPI by item analysis which would constitute reliable predictors of honor point ratio independently of intelligence.

Procedure:

Two item analysis groups of over and underachievers (27 in each group) were selected from 231 high school seniors on the basis of GPA compared with ACE scores. The groups were considered comparable in terms of MMPI, Insecurity Inventory, Otis IQ, Pintner IQ, and socioeconomic status. Their responses were then analysed by means of phi coefficients resulting in the isolation of 34 items which were significant beyond the .05 level. A key was then developed and the scale was administered to original 231 high school seniors to assess its validity and reliability.

Findings:

1. The split-half reliability was .62.
2. The scale correlated .43 with GPA and .11 with the Otis.
3. In another class of 271 the scale correlated .25 with GPA and -.02 with the Otis. The multiple correlation of the scale and Otis with GPA was .68.
4. All correlations with GPA were significant at the .01 level.
5. The scale was also tested with a sample of ninth grade over and underachievers. The scale was able to discriminate between the two groups but the amount of overlap was very great.
6. Comparison of this scale with those developed by Altus, Brown, and Owens revealed five duplications. They were items 146, 263, 124, 242 and 438.

I-C-1

MUSSELMAN, J. W., "Factors Associated with the Achievement of High School Pupils of Superior Intelligence", J. Exp. Educ., (1942), 11:53-68.

Purpose:

This study was undertaken in an attempt to answer the question "Why do intelligent pupils often fail or do mediocre school work?"

Subjects:

The subjects were 143 boys and 154 girls from five Baltimore high schools. Only those pupils from grades 9-12 whose Otis and Henmon-Nelson IQ's were 120 or above were included in the sample.

Procedure:

The following data were collected on each subject: (1) scores on either the Myers-Ruch High School Progress Test of the Sones-Harry High School Achievement Test, (2) scores on the Washburne Social Adjustment Inventory (WASI), (3) H. C. Link's Inventory of Activities and Interest (LIAI), (4) Sims Score Card for Socio-Economic Status, (5) Wrenn and McKeown Study Habits Inventory, (6) Physical Examination Questionnaire filled out by the school doctor, (7) a questionnaire on home backgrounds and (8) the subject's school record. Each subject's achievement ratio (AR) was obtained by subtracting his standard score on the intelligence test from his achievement test standard score. A positive AR indicates that a student is achieving better than might be expected of a pupil of his ability. The relationships of AR to the various variables were determined by analysis of variance.

Results:

1. The AR's indicated that the achievement of both boys and girls was considerably lower than might be expected. The boys were superior in terms of AR.
2. There was a significant relationship between AR's and truthfulness scores on the WASI. The most truthful students had the highest AR's.
3. There was a significant relationship (.01 level) between AR's and happiness as measured by the WASI. The happier students had higher AR's.
4. There was a significant (.01 level) relationship between AR and alienation as measured by the WASI. As AR's increased, alienation decreased.
5. There was a significant negative relationship between sympathy and AR.
6. There was a significant relationship between AR and goal directedness.
7. There was a significant relationship between AR and self-control as measured by the WASI.
8. There was a significant relationship between AR and general social adjustment as measured by the WASI.
9. A small negative significant relationship existed between AR and self-determination as measured by the LIAI. The same relationship existed for economic self-determination.
10. There was a significant relationship between AR and adjustment to the opposite sex as measured by the LIAI.

11. There was a significant relationship between AR and socio-economic status. High AR was associated with high socio-economic status.

12. Students from homes in which foreign languages were spoken had significantly higher AR's.

13. There was a significant relationship between AR and the number of American born grandparents. The fewer American grandparents a pupil had the higher his AR was likely to be.

14. There was a significant relationship between achievement ratio and the number of years of schooling pupils' parents had.

15. There was a significant relationship between AR and the number of siblings. Students with none of one or two brothers or sisters have higher AR's.

16. A significant relationship existed between AR and siblings' position in the family with older and younger siblings having higher AR's.

17. There was a significant relationship between AR and broken families. Students from broken families and homes have higher AR's.

18. There was no significant relationship between the doctor's estimate of the pupil's health and AR. However, there was a significant relationship between AR and the parents' health. Students whose parents' health was poor had higher AR's.

19. There was a significant relationship between AR and scores on the Wrenn Study Habits Inventory. Low AR's were associated with poor study habits.

Conclusions:

The stated conclusions are merely a restatement of the results; however, the authors did point out that "A single thread seems to bind these conclusions together. Often whenever a pupil of superior intelligence has a handicap, such as coming from a broken home...he works hard to overcome this handicap and consequently his achievement ratio increases."

I-C-1

NEMZEK, C. L., "The Value of the Bernreuter Personality Inventory for Direct and Differential Prediction of Academic Success as Measured by Teachers' Marks", J. Applied Psychol., (1938), 22:576-586.

Purpose:

To reveal the value of Bernreuter Personality Inventory for purposes of direct and differential prediction.

Subjects:

Data available for 92 high school boys and 99 high school girls on the following variables was used:

(1) intelligence quotients
(2) B1-N scores
(3) B2-S scores
(4) B4-D scores
(5) honor point averages in mathematics
(6) honor point averages in English
(7) honor point averages in history and social science
(8) honor point averages in languages

All of the students had completed at least the junior year of high school.

Procedure:

Zero order Pearson product-moment correlations were calculated for the eight variables. Not one coefficient met the usual criterion of statistical significance.

Conclusion:

There was no evidence found to indicate that the Bernreuter Inventory was measuring any traits that contributed to successful achievement in high school.

I-C-1

RYAN, F. J., and DAVIE, J. S., "Social Acceptance, Academic Achievement and Academic Aptitude Among High School Students", J. Educ. Res., (1958), 52:101-106.

Purpose:

The present study was concerned with the exploration of the relationship of social acceptance to classroom grades and academic aptitude among secondary school pupils.

Method:

The subjects were four classes of a high school. The total number of subjects was 326, 232 of whom were in the college prep course. Two related measures of social acceptability were obtained. Each student was given a roster of his classmates. On a five-point scale he was asked to rate the popularity of each member of his class. On a four-point scale he was asked to give his degree of association with each member of the class. The ratings received by each subject were averaged to obtain measures of popularity and association.

The average grade for the year in which the social acceptance measurements were made was taken as a measure of academic achievement. ACE scores were used to measure academic aptitude. Estimates of reliability for the social acceptance measures were obtained by means of the Spearman-Brown split-half method. This study utilized sophomore, junior and senior classes. Since the study programs taken by the college prep students differed from those of non-academic students, they were divided into groups. Among the college prep students, a further division was made for boys and (AC boys, AC girls, non-academic).

For each of the 12 subsamples, the three most socially acceptable students were compared with the three least socially acceptable with reference to grades and aptitude scores. Acceptability was determined separately on the basis of popularity and association.

In an effort to explore the shape of the curve expressing the relationship between social acceptance and classroom grades, the data from all college prep groups were combined and plotted.

Results and Conclusions:

1. A small and positive relationship exists between acceptance and grades. This relationship was not consistent among the subgroups.

2. A lesser degree of relationship exists between quantitative aptitude scores and acceptance. Verbal aptitude scores do not correlate significantly with social acceptance.

3. There is some evidence that the relationship between classroom grades and social acceptance is exponential, but such a relationship has not been demonstrated to be statistically significant.

The estimates of reliability for each of the four classes were as follows: Popularity: .95, .99, .98 and .98; Association: .90, .96, .89 and .89. Estimates of reliability for average grades for the three classes were .88, .92 and .90.

The correlations between popularity and association were as follows for the four classes: .88, .91, .88 and .82. The data indicate generally that gross measures of social acceptance account for only a small portion of variance of grades.

1-C-1

RYANS, D. G., "The Study of Observed Relationships Between Persistence Test Results, Intelligence Indices and Academic Success", J. Educ. Psychol., (1938), 29:573-580.

Purpose:

The purpose of this study was to measure the persistence in individuals, and compare this with intelligence indices and academic success. Also, it was hoped to prove that persistence and intelligence indices combined would give better prediction of academic success.

Procedure:

Intelligence was measured in 92 high school juniors by the Army Alpha Examination and in 40 junior college sophomores by the Otis Self Administering Test. Academic success was determined by computation of grades. Persistence was measured by a test involving consecutive effort at rational learning, self-ratings, and physical endurance. Subjects were grouped according to persistence into four equal groups, the upper 25%, etc. These four groups were then compared by percentage to intelligence and academic success.

Results:

Of those students in the upper 25% of the persistence group, over half were in the upper 25% in academic achievement. There was not so great a correlation between persistence and intelligence.

Conclusions:

In this study, persistence had a high correlation with school success, though it was unrelated to intelligence. The value of a valid test of persistence as a contributing predictive instrument in education is recognized.

I-C-1

SHAW, M. C., "Need Achievement Scales as Predictors of Academic Success", J. Educ. Psychol., (1951).

Purpose:

To determine whether or not three scales of need achievement make appropriate differentations between groups of high school students matched for ability but differing significantly in mean grade point average.

Subjects:

Subjects were selected from junior and senior classes of high school of 1800 students. Students with an IQ above 110 (California Test of Mental Maturity) and who achieved a GPA in the previous year of 2.00 (B) or a GPA of 1.5 or less were classified as underachievers. The sample included 18 male and 21 female achievers and 20 male and 19 female underachievers.

Procedure:

All subjects were administered the following tests:

1. McClelland Achievement Motivation Test
2. Edwards Personal Preference Schedule
3. French Test of Achievement Motivation

"The MAMT was administered with the use of an opaque projector under neutral conditions. The picture stimuli were cards 7 BM and 8 BM from the TAT and cards D and H of McClelland's series. Subjects responded to the four basic questions used by McClelland. Each MAMT response was scored twice by the author according to the criteria described by McClelland. The achievement level of subjects was not known to the scorer at the time the protocols were evaluated."

For purposes of statistical analysis, male and female groups were considered separately. Variance ratio (F) and t tests were applied to the scores of achievers and underachiever groups on each of the three need achievement measures used in order to establish the existence of homogeneity of variance and to determine the significance of differences between groups on these measure. Spearman rank order correlations were computed between each of the need achievement measures for each of the subgroups in the study in order to determine the extent to which the different achievement measures were measuring the same variable. An analysis of variance was carried out using the MAMT, achievement level and sex as differentiating criteria.

Findings:

Groups did not differ in performance on the California test of Mental Maturity. Analysis of the difference between achiever and underachiever groups on each of the three measures of need achievement showed significance between male achievers and underachievers on the French Need Achievement Scales. In none of the other comparisons was the difference between groups found to be significant.

Correlations between each of the three scales for each group used revealed few significant correlations.

The analysis of variance revealed that variation was highly significant (.001) among four separate pictures of the MAMT but not significant at the .05 level between either achievers or underachievers or between males and females. Lack of significance was found between all interaction variables.

Conclusions:

The study indicated that neither of the three tests have predictive value for the groups included in this study. The French Need Achievement Scale did reveal a difference significant at the .05 level for male members of the sample.

The single significant correlation was found between the Need Achievement Scale of the EPPS and the French Need Achievement Scale for male achievers.

Analysis of variance indicated that the greatest source of variance existed among the pictures, rather than between groups of achievers and underachievers, or between sexes.

I-C-3

HEIMANN, R. A., and SCHENK, Q. F., "Relations of Social Class and Sex Differences to High School Achievement", School Rev., (1954), 62:213-221.

Purpose:

The investigation was designed to study school marks and test scores in relation to social class and sex differences.

Subjects:

The subjects were 120 sophomores enrolled in two large and two small Wisconsin high schools.

Procedure:

The data for this study were drawn from a larger investigation, "The Wisconsin Counseling Study" sponsored by the University of Wisconsin. The subjects were divided into five social classes using the classes and criteria developed by Hollingshead in the Elmtown's Youth Study. Classification was based on: (1) father's occupation, (2) father's education, (3) mother's occupation, (4) mother's education, (5) number of siblings, (6) educational aspirations of the family, (7) family participation in community affairs, (8) the type of curriculum followed by the student, and (9) the work experience of the student. The number of students was reduced to 114 after the social class categories were made, the 6 cases which were dropped being in Classes I, II and V. The study was concerned with differences between Class III (44 subjects) and Class IV (70 subjects). The classes were compared in terms of average grades and average score on the Henmon-Nelson Test of Mental Maturity (HNTMM). The same comparisons were made according to sex. Boys and girls were compared within each class and among the classes.

Results:

1. Students from Class III had significantly (.01 level) higher Henmon scores and grade averages than students from Class IV.
2. Girls had significantly higher (.01 level) Henmon-Nelson scores and grade averages than boys.
3. When the social class differences were compared within the same sex group, students in social Class III were found to obtain marks superior to those made by students in social Class IV regardless of sex. The scores on the Henmon of Class III students were significantly superior to those obtained by members of Class IV regardless of sex.
4. The within-class sex differences were not significant but they were somewhat higher for girls.
5. When the test scores of Class III boys were compared with those of Class IV girls, the difference was not significant.

Conclusions:

1. Both social-class and sex factors operate as important differentials in school performance, and performance in the HNTMM for the individuals in this study.
2. Case study data indicate that many variables operate to modify the relationship between social class and achievement for a group. Some of these factors are level of aspiration, family educational expectations and compliancy or rebellion on the part of the individual students.

I-C-3

SHAW, M. C., and McCUEN, J. T., "The Onset of Academic Underachievement in Bright Children", J. Educ. Psychol., (1960), 51:103-107.

Purpose:

The purposes of this study were to determine whether there is any specific academic level at which underachievement can be said to begin and to discover the subsequent pattern of achievement.

Subjects:

The subjects for the study were four groups of 11th and 12th grade high school students consisting of 36 male achievers, 36 male underachievers, 45 female achievers, and 17 female underachievers.

Procedure:

A student was classified as an underachiever if he had achieved an IQ of 110 or below on the Pinter General Ability Test: Verbal Series, and had earned a grade point average below the class mean. Students with GPA's above the class mean and IQ's of 110 or above were classed as achievers. All subjects had gone through school in the same school district. The groups were comparable in terms of means and variances for IQ and GPA.

Findings:

1. Comparison of male achievers and underachievers indicates a difference, significant at the .01 level beginning at the third grade level and becoming significantly greater until the tenth grade (although still significant at the .01 level). A difference in GPA actually exists in favor of the achiever group at grades one and two but it is not significant. The general trend of grades in both groups tends to be the same throughout - there is never any overlap.

2. Comparison of female achievers and underachievers reveals that through grade five the underachievers exceed the achievers in GPA although not at a significant level. At grade six the achievers earned a higher GPA and until the tenth grade this difference increases becoming significant at grade 9.

Conclusions:

1. Apparently a predisposition to underachieve exists in male underachievers when they enter school.

2. For male underachievers the problem becomes steadily more serious until grade 10.

3. There is a great deal of difference in what is found to be true of male and female underachievers.

4. The results offer no clues as to why girl underachievers tend to do better than achievers for the first five years, nor are there any facts to explain the sharp drop in underachievers' achievement starting at grade six.

5. Underachievement is not a temporary phenomena in the life of a student, but is chronic.

Discussion:

The authors point out the need for early identification and counseling. They also suggest that research needs to be done with the parents of underachievers. Also, we need to know what factors in the school situation tend to reinforce the underachiever's predisposition to achieve.

I-C-4

EDWARDS, T. B., and WILSON, A. B., "The Specialization of Interests and Academic Achievement", Harvard Educ. Rev., (1958), 28:183-196.

Purpose:

The purpose of this study was to show the effect of student interests on academic careers, and the relationship between interests and problem solving techniques, type of learning, sex differences, and academic rewards.

Method:

Two scales were constructed, one to differentiate between students interested in mechanical and physical events, and the other to differentiate between students interested in natural sciences and those interested in social recognition. These scales were issued to high school students enrolled in college prep chemistry and physics classes. The same students took the Anderson Chemistry Test, a physics achievement test, and replied to questionnaires concerning their educational and occupational aspirations.

Results:

Those persons oriented toward the non-social environment were termed theoretic, and those socially oriented were termed prudent. Boys were more theoretic (66%) while girls were more prudent (73%). The girls also had a higher overall grade average. This also corresponded to the fact that both boys and girls in the prudent categories had higher grades than those students that were theoretic. This was true not only in the social studies, but in the science and math courses also.

Those students showing to be prudent by the scale were more interested in social welfare, education, etc., while the theoretics tended towards engineering, science and mathematics for careers.

Conslusions:

On the average, boys were more interested in natural science than girls; while girls were more interested in social studies, people, and social esteem. Those who were more interested in social studies got higher overall academic grades. Those who were primarily interested in science did not get higher grades, even in science. The theoretic student had specialized ability in science and mathematics while prudent students had specialized ability in social studies and English.

I-C-4

FRANDSEN, A. N., and SESSION, A. D., "Interest and School Achievement", Educ. Psychol. Measmt., (1953), 13:94-101.

Purpose:

The purpose of the study was to investigate the relationship between interest (motivation) and achievement in academic courses while holding aptitude constant.

Procedure:

For 137 high school seniors a measure of achievement (grade point average) and measures of interest (Kuder Preference Record Scores and self-ratings) were obtained on each of the areas covered by the Kuder Form C. For each individual student these three measures were rank correlated. In this way aptitude did not enter into the analysis.

Results:

The median correlation between rank order, Kuder interests and rank order of grades is .27 which indicates that 50% of the Rhos were higher than this. The difference between a chance distribution of such Rhos and the observed distribution yields an X of 18.25 which is significant at the 1% level.

The median Rho between self-rating interest and Kuder interest scores is .48, hence they are somewhat in agreement. But when self-rated interest is correlated with grade point average, the mean Rho is .51.

Conclusions:

Interest as motives may be affecting relative achievement. But some students are apparently more highly motivated by extrinsic motives.

I-C-4

BATTLE, H. J., "Relation Between Personal Values and Scholastic Achievement", J. Exp. Educ., (1957), 26:27-41.

Purpose:

To examine the following hypotheses:

1. Among pupils of similar age and sex, the value patterns of those who receive high marks in a particular subject tend to have higher correlation with pupil value patterns considered ideal by the teacher who determines the marks than do the patterns of pupils who receive low marks in the subject.

2. If aptitude, age, and sex are controlled, the value patterns of pupils with high scholarship averages in their several subjects will tend to have higher correlation with a composite value pattern determined by several teachers in the school than will patterns of pupils with low achieving averages.

3. In a Spearman two-factor pattern composed of a sample of teachers, a given number of high achieving pupils, and the same number of low achieving pupils in a particular high school, the loadings on the common factor for teachers and high achieving pupils will tend to exceed loadings on this factor for low achieving pupils.

Method:

This was primarily a statistical study in which inverted analysis, or the Q-technique was used. It provided for the treatment of a person with respect to a sample of traits instead of a trait with respect to a sample of persons. Two basic assumptions of this technique were that the mean score for a sample of traits would not differ much from one person to another; and that the scores given to the large sample of traits tended to be distributed normally.

A sample of values was derived through the use of suggestions from studies of adolescence and previously developed concepts of values (Developmental Tasks of Adolescence by Havighurst and SRA Youth Inventory).

Pupils sorted the sample to describe their own value patterns (three piles were used in sorting). Teachers sorted it to describe their concept of a desirable pattern for pupils. With age, sex and aptitude controlled, pupils with high marks and pupils with low marks were compared with the teacher ideal pattern.

Results:

The investigator examined hypothesis number 1 by correlating value patterns of low and high achievers with the pattern considered by the teacher to be ideal for pupils. Of the twenty-four pairs of low and high achievers, there were two for which the hypothesis was reversed and 22 or 92% for which it was confirmed. Of the ten significant differences (5% level), one was reversed and nine were confirmed. Among the 21 pairs with reliability coefficients of .45 or more, the hypothesis was reversed in one difference and confirmed in 20 (Reliability was determined by a re-sorting).

All of the twelve pairs with reliability of .60 or more had differences that confirmed the hypothesis. The null hypothesis of no difference between the low and high achievers with respect to correlation of pupil and teacher value patterns was rejected.

The findings for the second hypothesis were in agreement with those of the first. Of the twelve differences obtained, the hypothesis was reversed in one and confirmed in eleven or 91.7 percent of them. Differences for all of the eleven pairs with reliability of .45 or more confirmed the hypothesis. A chi-square of the data also confirmed the hypothesis. The difference between high and low achievers was found to be significant at the 5% level.

In examining the third hypothesis, four low achieving boys, four low achieving girls, four high achieving boys, and four high achieving girls were used. Observation of the intercorrelations matrix revealed a rather stable positive relation among high achieving pupils but very little consistency in the correlations of low achievers either among themselves or with high achieving pupils. This was demonstrated again in the comparatively high degree of specificity for low achievers in the factor pattern.

Conclusions:

It is reasonable to conclude within the limits of these data and with recognition of assumptions made in the investigation that the degree of similarity of teacher ideal and pupil patterns of values tends to be related directly to the level of pupil achievement as rated by teachers in terms of school marks.

I-C-4

VAUGHAN, L. E., "Relationship of Values to Leadership, Scholarship and Vocational Choice", Ph.D. Thesis, University of Nebraska, Department of Educational Psychology and Measurements.

Purpose:

The purpose of this study was to determine whether there is a relationship between the personal values of high school students and the educational objectives of leadership, scholarship, and vocational selection.

Method:

In presenting the setting for this study, it is important to state the three basic hypotheses tested:

(1) There is no significant difference between the value area scores of high school student leaders and the value area scores of those students not elected or appointed to positions of leadership in school activities.

(2) An Inventory of Values area score does not make any significant contribution toward the prediction of grade average when the Henmon-Nelson KQ is held constant.

(3) There is no significant difference between value area scores on the Inventory of Values of high school senior class students interested in the following vocational fields: Business, Engineering, Medicine, Teaching, "I don't know." If a student marked the latter he was asked to explain. This could then be analyzed further as to categories, etc. The students used in this study were the members of the class of 1958 at Lincoln Southeast High School.

To test hypothesis #1, 29 boys and 29 girls were included in the leader group while 52 boys and 52 girls made up the non-leader group. To test hypothesis #2, 162 students' scores were used. The number used depended upon whether the students had an IQ measurement as well as value scores. To test hypothesis #3, the choice of the various vocational fields determined the population, which was: Business, 41; Teaching, 29; Engineering, 22; Medicine, 10 and "I don't know", 9.

Two additional aspects of the study required different samples. Thirty students were selected randomly to compare the value and interest scores by correlation coefficients. To determine the change that took place from the sophomore to the senior year for leader and non-leader groups, 48 leaders and 56 non-leaders were used.

Measuring Instruments and Materials: Values for the study were interpreted to be those which Poe's Inventory of Values was designed to measure. The inventory consists of 150 items of a Likert-type scale. A High School Glossary was necessary because of a standardization for college students. The criterion of leadership was a position of leadership at sometime between the 7th and 12th grades. Leaders in senior high were identified through use of the school newspaper, the annual, club records, and group sponsors. Each group had equal numbers of male and female.

There were 162 students for whom value scores, IQ's and grade averages were available. Analysis of multiple regression was used to determine whether value score and IQ might be used to predict grade averages. In the vocational area, the value scores used were those of the second administration of the Inventory of Values. The mean value area of each was calculated for all groups. The difference-between the eight mean value scores and each two vocational groups was made.

Results:

Hypothesis #1 was refuted by the results of this investigation. The power value showed a high positive relationship with leadership at the 1% level of confidence. Hypothesis #2 was refuted because four out of the possible eight value areas do aid in the prediction of grade averages. Humanitarian, Material, Aesthetic and Religious value partial correlation coefficients are significant at the 1% level (5% level for Religious). Hypothesis #3 was refuted because five out of eight value areas do show significant differences in at least two of the five vocational field choices. Students choosing Business were more "materialistic" than those who chose Medicine at the 1% level. Students choosing teaching scored higher on the Religious value area than either those students who chose Business or Engineering at the 1% level.

The intercorrelations between values and interests showed every value area is significantly correlated with at least one interest area. Twelve of the eighty coefficients are significant either at the 1% or 5% level of confidence and nine of the twelve areas are in a positive direction.

All value areas mean scores decreased from the sophomore to the senior year in high school for the leader group. For the non-leader group, all the social contact values are score decreased. For both the leader and non-leader groups six out of ten interest area mean scores decreased from the sophomore to the senior year in high school.

Conclusions:

One conclusion that seems warranted is that the Poe Inventory of Values can be used at the secondary level. A major finding of the study was that Power Value is related to leadership in school activities.

Knowing the values and IQ of a student would help in predicting the student's scholastic achievement. Those most useful are Humanitarian, Material and Aesthetic. In high school, the Poe Inventory can be effective in distinguishing the basic interests of students who have identified themselves with different vocational fields.

Another finding was that values do change in high school, but no pattern is evident to indicate which values change significantly and which do not.

I-C-5

CARTER, H. D., "Improving the Prediction of School Achievement by Use of the California Study Methods Survey", Educ. Admin. Supervision, (1959), 45:255-260.

Purpose:

To predict high school grade point averages from scores on the American Council on Educational Psychology Examination and the California Study Methods Survey which includes factors of attitude toward school, mechanics of study and planning.

Procedure:

Data was collected from over 3000 students in four high schools. Grade point averages were computed, and the ACE intelligence test scores and study survey scores were obtained. Three random samples of subjects were selected from the 3000. Scores on the tests were correlated with GPA.

Results:

The scores on the Henmon-Nelson IQ test were used instead of ACE for the first sample of 116 11th graders. This IQ score correlated .66 with GPA, the Study Survey score correlated .60. The HN IQ test scores and Study Survey scores correlated .44.

In the second sample of 289 10th graders the highest correlation was .60 between Study Survey scores and GPA, ACE total scores correlated .53 with GPA. In the third sample of 211 10th graders, Strong Survey scores correlated .57 and ACE scores correlated .50 with GPA.

The multiple correlation coefficients of Study survey score and IQ score with GPA were .74, .68 and .66 in the three samples respectively. In each case partial coefficients showed that the intelligence test and the Study Survey made substantial independent contributions to prediction of high school achievement.

Conclusions:

The Study Methods Survey predicts school achievement about as well as do commonly used group intelligence tests. Partial and multiple correlation analysis shows that the inventory of study methods makes an independent contribution to prediction of GPA.

I-C-6

DREWS, Elizabeth, and TEAHAN, J. E., "Parental Attitudes and Academic Achievement", J. Clin. Psychol., (1957), 13:328-332.

Purpose:

This study was designed to test the hypothesis that parents of high academic achievers will be less permissive and accepting in the treatment of their children than the parents of low academic achievers.

Subjects:

The subjects were the mothers of 68 students who were paired on the basis of sex, IQ, socioeconomic status and father's occupation. Group I consisted of the mothers of 20 high ability students (IQ above 130) who were high achievers (straight A's). Group II consisted of the mothers of 20 high ability students who were low achievers. Group III consisted of the mothers of 14 average ability students (IQ 93-120) who were low achievers, and Group IV consisted of the mothers of 14 average ability students who were high achievers. In all cases, the differences between the IQ's of the pairs were no greater than 5 points.

Procedure:

A parental attitude scale (PAS) was constructed which consisted of 30 items taken from the Shoben Parental Attitude Scale. The scale consisted of 3 subjects (10 items each) dominating (d), ignoring (I), and possessive (P). The items were presented in the Likert format and administered to all subjects.

Results:

The mothers of high achieving students had higher scores on both the dominating and ignoring scales. For the D scale the difference was significant at the .01 level for the mothers of high ability students. For the I scale, the difference was significant for the mothers of the high ability and low ability groups. There was no significant difference in the scores of the mothers of high and low achievers on the possessiveness scale.

Conclusions:

The high achiever is a child who has a rigidly defined place within the home which he is expected to keep with docile acceptance. The mothers of high achievers appear to be more authoritarian in the treatment of their children.

I-C-6

FORD, T. R., "Social Factors Affecting Academic Performance: Further Evidence", School Rev., (1957), 65:415-422.

Purpose:

This study was designed to test the hypothesis that two groups of junior high school students with the same potential for academic work, as measured by intelligence test scores, but who differ with respect to actual academic performance, will differ significantly with respect to certain test variables.

Subjects:

The subjects were 48 junior high school students who had scored within the 10-point middle range on the California Short Form Mental Maturity Battery. Twenty-four were classed as overachievers and twenty-four were classed as underachievers by their teachers. It was presumed that the overachievers were probably doing above average work and the underachievers doing below average work.

Procedure:

All subjects were interviewed by members of a sociology class, composed of advanced undergraduate students majoring in Education, using an interview schedule designed to secure social and attitudinal data.

Results:

1. Significantly more girls (.001 level) were included in the overachievers. Seventeen of the overachievers were girls, while only four of the underachievers were girls.
2. Significantly more parents (.05 level) of overachievers were members of the PTA. Three-fourths of the overachievers reported that their parents were members, while only one-fourth of the underachievers' parents were members.
3. Significantly more overachievers (.01 level) liked school "very much."
4. Significantly more of the overachievers (.01 level) aspired to professional occupations. Eighteen of the overachievers aspired to professional occupations, while only eight of the underachievers indicated a desire for a career in the professions.
5. Two-thirds of the overachievers reported that their parents wanted them to enter professions, while less than a fourth of the underachievers believed that their parents wanted them to enter a profession. The difference is significant at the .01 level.
6. Significantly more of the overachievers (.01 level) reported that their parents would scold them for poor marks.

Conclusions:

Parental interests in, aspirations for, and relations with their children exert a powerful influence on the children's work.

I-C-6

KURTZ, J. J., and SWENSON, Esther J., "Factors Related to Overachievement and Underachievement in School", School Review, (1951), 59:472-480.

Purpose:

This investigation was undertaken to study some of the factors other than intelligence which may be related to school achievement.

Subjects:

Subjects were 40 over and 40 underachievers from grades 4 to 12. In each group there were four each from grades 4-8 and five each from grades 9-12.

Procedure:

The subjects were identified as under or overachievers on the basis of the Otis Intelligence test scores and achievement scores on the Iowa Every Pupil Test of Basic Skills, the Unit Scales of Attainment and Reading and the Hundred Problem Arithmetic Test. Students whose achievement was definitely below or above expectation were designated as overachievers (no criterion was given for defining above or below). The following information was obtained for each subject: (1) interviews with the children themselves, their parents, and their teachers, (2) ratings on attitudes toward the school situation, educational achievement and the importance of education, (3) information regarding educational and vocational aims, and (4) reports of classroom observation of the subjects. The information was organized into five areas: (1) home conditions, (2) peer relations, (3) physical and mental well-being, (3) academic inclination and (5) aspirations and prospects for the future.

Results:

1. Home conditions - in general, the home conditions of the overachievers appeared to be favorable. Parents showed interest, affection and pride in their children. The home atmosphere of the underachiever more often appeared to be unfavorable. The atmosphere was not always pleasant and their did not seem to be much exchange of affection. Parents did not seem to expect much of them.

2. Peer relations - the peer relations of overachievers seemed to be more plentiful and supportive. Overachievers had friends with high standards regarding school achievement while underachievers tended to have friends with less favorable attitudes.

3. Physical and mental well-being - overachievers tended to possess a feeling of adequacy to be alert and attentive in class and to exhibit tendencies to act superior. Underachievers did not appear to be as happy and were often described as having an inferiority complex. Physical problems and emotional conflicts seemed to be more frequent among underachievers.

4. Academic inclination - overachievers appeared to have less aversion to book learning and have a tendency to do more reading and get more satisfaction from it. Underachievers were less academically inclined, preferring to work with their hands.

5. Aspirations and prospects for the future - overachievers had higher educational and vocational aims and placed a higher value on education. Underachievers did not seem to see very far ahead and had limited goals.

Conclusions:

When the factors are taken in combination it appears that overachievers live in a more favorable total situation than underachievers.

I-D-1

BROEN, W. E., Jr., "Anxiety, Intelligence, and Achievement", Psychol. Reports, (1959), 5:701-704.

Purpose:

Anxiety is felt to be an undesirable variable in the intelligence testing situation which should be eliminated in order to accurately measure ability to achieve. If, in spite of suppression procedures, the testees' anxiety level is still felt to be above average, it is usually said that his intellectual potential to achieve is underestimated.

The prediction of achievement from intelligence test performance is a function of the similar influence of variables in both situations. Unless anxiety is related differently to intelligence testing and achievement situations, is aroused more intelligence testing situation or interferes more with performance in that situation, or unless the interfering anxiety of highly anxious testees decreases predictably over time, elimination of anxiety would be expected to lower the utility of intelligence tests for measuring current performance or predicting future performance. Utility will be lowered if one of these conditions doesn't hold because test scores of anxious Ss will be raised by eliminating anxiety in the test situation, while it will still act to decrease their performance in achievement situations.

The purpose of the present study is to investigate the case for suppressing anxiety, through understanding the relation between anxiety, intelligence test performance, and achievement.

Procedure:

Subjects were 80 fifth-grade boys. At the beginning of the school year they were administered the verbal battery of the Lorge-Thorndike Intelligence Test, Level 3, Form A; the Science Research Associates Achievement Series, Form A, Grades 4-6; and the Children's Test Anxiety Scale.

The anxiety scores were correlated with the 10 achievement measures in the SRA series and with the Lorge-Throndike scores. Seven transformations were made to test the significance of the differences between anxiety-IQ and anxiety-achievement correlation. Another check on relation between anxiety, intelligence, and current achievement was provided by testing the SRA achievement score differences for a second sample of 37 pairs of high and low anxious boys matched on Lorge-Thorndike scores. The mean difference in anxiety scores for these two groups was 13.4 ($p < .01$).

A year later the sample of 37 pairs was again given the SRA achievement scale and the difference in scores taken as a measure of learning or a kind of future achievement score.

Results:

The anxiety-intelligence correlation of -.22 was not significantly different from any of the anxiety-achievement correlations, all of which were negative. That anxiety is similarly related to both intelligence and achievement between high and low anxious groups matched on intelligence. Comparisons of achievement of these high and low anxious groups a year later also showed no significant difference.

Conclusions:

The results indicate in the usual school situation, anxiety has an inverse relationship to both current and future achievement, and intelligence test performance. These findings suggest that decreased performance of anxious children in the intelligence test situation accurately reflects their lowered classroom achievement. Anxiety in the intelligence test situation should be interpreted as a variable which adds to the accuracy of achievement prediction.

I-D-1

HAGGARD, E. A., "Socialization, Personality and Academic Achievement in Gifted Children", School Rev., (1957), 65:388-414.

Purpose:

This study was an attempt to discover the relationship between academic achievement and the individual's personality and experiences.

Procedure:

Forty-five students from the Laboratory School of the University of Chicago participated in this study. The study covers a five-year period in which these students were observed and tested from grade 3 through grade 7. The main areas of interest were a) parental pressures, b) personality tests, c) behavior observations, d) mental ability tests, and e) academic achievement tests. Parental pressures were obtained through interview questionnaires, teacher's reports, and information from the files on each child. Personality tests used were the Rorschach, the Children's Appreciation and the Thematic Apperception Tests, the Draw a Person Test, Sentence Completion Tests, and a few others. Behavioral observations were made periodically in classrooms during lunchtime, on the playground, and at various social activities. Mental ability tests used were Primary Mental Abilities Tests, the Stanford-Benet, and the Adult form of the Wechsler-Bellvue Tests. Academic achievement was measured by school performance and test results in various academic fields.

The students were tested and observed over the five-year period, and information was checked for changes in the various students, or patterns carried throughout the period. Also the high achievers were compared with the low achievers.

Results:

Those students who were high achievers in all fields responded to socialization pressures of adults, and they seemed to strive toward adult standards of behavior although they showed strong antagonistic attitudes towards adults. This attitude was not found among low achievers. The high achievers were able to channel their anxieties, and were more aggressive, persistent, hard driving and competitive than the low achievers. Those students who were high achievers in reading were more withdrawn, had mildly negative attitudes towards parents, and were more independent in thought and action. Students who were high achievers in spelling and language were more dependent upon their parents, but lacked affection for them. They were dependent upon outside sources for direction of thoughts and actions. About three-fourths of the boys performed better in reading, and about three-fourths of the girls performed better in spelling and language.

Conclusions:

It was assumed that the level and pattern of academic achievement are related to how an individual perceives his world and relates to it. The research has not demonstrated a one-to-one tie between the intellectual skills required in order to achieve a high level of proficiency in the tests of reading, spelling and language, and the characteristic personality structure of the children who do well on those tests. The findings indicate a great deal of correspondence between the intellectual and the personality facets of behavior when "personality" is taken to mean the manner in which the individuals relate to other persons, symbols, or things.

I-D-1

KEYS, N., and WHITESIDE, G. H., "The Relation of Nervous-Emotional Stability to Educational Achievement", J. Educ. Psychol., (1930), 21:429-441.

Purpose:

The purpose of this study was to determine if any correlation exists between IQ and undue emotionality and an excess of psychoneurotic symptoms, to determine differences in educational achievement obtained by emotionally stable and unstable groups, and to see if with equal IQ, emotional stability has an effect on scholastic achievement.

Method:

Nervous-emotional stabiltiy was measured by teachers' ratings and pupils' own scores on the Woodworth-Cody Questionnaire. IQ was measured by the Stanford-Binet Intelligence test. Educational achievement was measured by the Stanford Achievement test. These tests were administered to a total of 104 students from grades 7, 8, and 9. Two groups of 30 stable children and 30 nervous and emotional children were chosen for comparison.

Results:

Children in grades 7, 8, and 9 who are characterized by their teachers and by their own scores on the Woodworth-Cody Questionnaire as conspicuously nervous and emotional display a strong and reliable tendency to average more than one year retarded in age-grade standing, nearly two years lower in mental and educational age, and some eighteen points lower in IQ as compared with their more stable classmates. When age and intelligence were matched, the emotional group was on the average .63 of a year behind in grade placement, and more than a year lower in educational age.

Conclusions:

There is a well-marked and reliable tendency for pupils characterized as conspicuously nervous and emotional to fall far below the emotionally stable in intelligence and school standing.

I-D-1

McCANDLESS, B. R., and CASTANEDA, A., "Anxiety in Children, School Achievement and Intelligence", Child Development, (1956), 27:379-382.

Purpose:

To report the correlations between anxiety, as defined by the Children's Manifest Anxiety Scale (CMAS), academic achievement and intelligence.

Procedure:

Scores on the CMAS and the Iowa Every Pupil Test (IEPT) were obtained for 4th, 5th, and 6th grade subjects and on the Otis Quick Scoring Test of Mental Ability. Product-moment correlations for boys and girls in each grade were computed between CMAS scores, ITED scores and Otis Scores. A multiple regression equation was developed to predict grades from the CMAS, ITED, and Otis.

Results:

1. Thirteen of the CMAS-IEPT correlations were significant.
2. Correlations between CMAS and Otis scores were -.16 for boys and -.43 for girls.
3. The multiple correlation was .61 for boys and .84 for girls.
4. Partial correlations between CMAS and IEPT with intelligence held constant were -.28 for boys and -.45 for girls.

Conclusions:

1. CMAS scores are related to school achievement most strongly for the 6th grade portion of the 4th, 5th, and 6th grade public school population.
2. CMAS scores are related to intelligence scores for sixth grade girls and are significantly related to achievement when intelligence is partialed out.

I-D-1

STEERE, H. J., "The Effects of Character Traits on Scholastic Achievement", School and Soc., (1929), 29:707-708.

Purpose:

To study the effect of character traits on scholastic accomplishment.

Method:

Five-hundred-seven pupils of the median school age of nine years three months were used in this study.

The basic traits studied were: initiative, control of attention, persistence, trustworthiness, and sense of accuracy.

In each of the schools in the study, a selected group of teachers was chosen to give the character ratings. All the various ratings for each pupil were averaged for each trait, reducing them to a single composite rating. These character ratings were then compared with the final scholarship ratings for the year for these pupils.

Group IQ ratings in the Ss were obtained by the Terman Group Test or the Otis Group Test.

Results:

Correlation of scholarship and IQ ratings .48.
Correlation of scholarship and character ratings .73.

These results indicate a much more substantial relationship between character traits and scholarship than between IQ and scholarship. A check of these results by partial correlation method clearly supported this conclusion. When IQ was controlled and the groups were alike except for character development, there was a substantial difference in median scholarship.

| IQ level | 95 | 95-105 | 105-115 | 115-125 | 125- |
|---|---|---|---|---|---|
| Difference in median scholarship | 7. | 6.8 | 6.3 | 8.7 | 3.5 |

I-D-3 also I-D-6

THORNDIKE, R. L., "Community Variables as Predictors of Intelligence and Academic Achievement", J. Educ. Psychol., (1951), 42:321-338.

Purpose:

This study was undertaken to investigate the effectiveness of certain community variables in the prediction of intelligence and academic achievement as measured by a standardized achievement test.

Procedure:

Data were collected for a representative sample of communities from across the country, concerning various community characteristics and the average IQ and average academic achievement. The data were obtained from the 1940 census, and from the standardization of the Metropolitan Achievement Test (which included scores on the Pitner Intelligence Tests). An achievement index was obtained for each community by averaging the average scale scores on the Metropolitan for the separate grades in the community, weighting each grade equally. The average IQ of the children taking the tests in each community was taken as the index of intelligence for the community.

Community variables studied were: population, percent native-born white, percent under 5 years old, percent over 21 years old, median grade reached by the adult population, percent of adults who were high school graduates, percent of males and females employed, persons per thousand engaged in a profession, male and female, domestic servants per thousand population, percent of homes owner-occupied, percent of homes tenant-occupied, percent of homes over-crowded, percent of homes needing major repair, percent of homes lacking private bath, percent of owner-occupied homes mortgaged, median home rental, per capita retail sales, per capita food sales, per capita retail sales for county and average age of students in each grade. Intercorrelations were then computed between the variables and various multiple correlation equations were tried.

Findings:

Significant correlations with intelligence were: measures of education of the adult population (.36, -.43, and .33), measures of home ownership (.37 and -.39), indices of the quality and cost of housing (-.30 and -.30 and .32) proportion of native-born whites (.28) and rate of female workers (.28). The multiple correlations for predicitng IQ using various combinations of variables ranged from .482 using two variables to .561 using five variables. The only two variables significantly correlated with the achievement test scores were the frequency of professional workers (.25) and the median grade reached by the adult population (.21). Multiple correlations predicting achievement test indices ranged from .29 using two variables to .33 using 4 variables.

Conslusions:

Intelligence is significantly related to certain community variables or characteristics. There is little relationship between the community variables studied and academic achievement as measured by the Metropolitan Achievement Test.

I-D-5

CUFF, N. B., "Study Habits in Grades Four to Twelve", J. Educ. Psychol., (1937), 28:295-301.

Purpose:

To answer the following questions: (1) What are the good and bad study activities frequently engaged in by pupils in grades four to twelve? (2) How do the methods of study followed by pupils of superior achievement differ from those followed by pupils of inferior achievement? (3) How do study habits of bright pupils differ from those of dull pupils? (4) How do the methods of study of the youngest and oldest pupils in a given group differ? (5) How does the general quality of study habits compare for various grades? (6) What are the most important study habits in order of merit as determined by different criteria?

Method:

A survey was conducted through the Paris (Kentucky) City Teachers Association, of over 500 relevant contributions and a list of 125 statements about study habits most often cited was compiled. These statements were ranked by frequency and the top ten were listed as possibly the most important study habits.

A question list was given to 1250 students in grades 4 to 12 concerning study habits. The responses were ranked according to number of students answering yes or no who were above Q3 in scholastic success. These were ranked by frequency of response and the ten top items were recorded.

Results:

Examination of the results of the survey conducted by the Teachers Association suggests it may have been tinged by research at the college level, that only six rules were important in over 50% of the studies, and these may not apply to elementary school children. The results of the second study with 1250 students did not agree with the list from the first study. There were only two items that appeared in both lists, and they were not in the same relative position. A comparison of the results show that the percentage of successful pupils answering a question in excess of the percentage of failing pupils does not indicate how definitely the item discriminates between the bright and the dull or the youngest or oldest. The comparisons of the pupils in the high and low achievement groups reveal that in every grade the superior students have better study habits.

Conclusions:

One cannot say categorically that a study habit is either good or bad. A given rule may be followed more exactly by inferior than by superior groups, and yet not be a faulty habit. For example, 70% of the inferior group responded yes to the question: "usually look up in a dictionary new words." Bright, young and superior pupils in every grade have qualitatively (17%) more helpful study habits than do others. Methods of study habits apparently crystallize in the elementary grades and do not as a rule improve appreciably thereafter.

When we consider a classroom of boys and girls in either the early grades or the upper grades, it may be said in general those who are succeeding in their school work will also be succeeding in their social relationships with their peers. A tentative hypothesis that achievement as a basic factor in acceptability precedes rather than follows this acceptability is suggested by the change which takes place between the time the child is in kindergarten and the time he is in the first grade and is beginning to experience some of the activities of which school success is made. In kindergarten, before academic success is evident, the future achiever is not chosen in social relationships any more frequently than the future nonachiever. Early in the first grade with a different kind of achievement, those who are successful in this achievement are also the socially most accepted.

I-D-6

BUSWELL, M. M., "The Relationship Between the Social Structure of the Classroom and the Academic Success of the Pupils", J. Exper. Educ., (1953), 22:37-52.

Purpose:

To determine whether or not those children who are accepted by their peers differ in certain achievements from those who are rejected.

Method:

The present study of the relationship between social acceptability and achievement began with the selection through a process of randomization of a group of 321 fifth graders and 286 kindergarteners who were to be studied. To the older group was given a battery of achievement tests, an IQ test, and questionnaire to determine socio-economic status, and three measures of social acceptability. The younger children were given readiness tests and IQ tests, and were interviewed individually regarding their choice of friends.

From the sociometric data, two groups of children were selected at each level, one group that was well liked by the others and one group that was not. The children in these extreme groups of social acceptability were studied both before and after a summer vacation. After the assumptions basic to the statistical procedures had been satisfied, those two groups of children at each level were compared by means of the technique of analysis of variance and covariance to see whether or not, and how, they differed.

Results:

1. At all levels, with no factors controlled, the two extreme groups in acceptability were significantly different in mean achievement always in favor of the accepted group.
2. When IQ and socio-economic status were controlled, these differences between the means in the various achievements disappeared.
3. When IQ alone was controlled, there was still no difference between the mean achievement of the two groups.
4. When socio-economic status alone was controlled there was a difference, except in the case of the arithmetic score in the sixth grade. This arithmetic test is the one test on which the control of socio-economic status was found to exert an influence.

Results for the lower grade group:

1. In the first grade the acceptance and rejection of hypotheses follow the same pattern as in the upper grades. With no factors controlled, the accepted group had a significantly higher mean score in reading readiness than the isolated group; with mental ability and chronological age controlled, the differences were no longer seen to exist.
2. The only time when no relationship was found between those who were acceptable and those who were achieving was at the kindergarten level.

I-D-6

CHRISTENSEN, C. M., "Relationship Between Pupil Achievement, Pupil-Affect Need, Teacher Warmth and Teacher Permissiveness", J. Educ. Psychol., (1950), 51:169-174.

Purpose:

This study was designed to test four hypotheses: (1) positive affective response (warmth) of teacher is positively related to achievement gains, (2) permissiveness of teacher is negatively related to achievement gains, (3) teacher warmth and permissiveness interact significantly such that warm, directive teachers will produce the greatest achievement gains, and (4) affective needs of pupils interact significantly with teacher warmth and permissiveness.

Subjects:

The subjects were 10 fifth grade classes, 10 fourth grade classes, and 10 fourth grade teachers.

Procedure:

All fourth grade pupils were given Warmth and Permissiveness scales (developed by the author) and a cognitive-affective Scale (developed by Della Piana and Gage). The fifth grade pupils were given the cognitive-affective scale to measure the affect of the pupils. In addition, the Iowa tests of Basic Skills had been administered to the fifth graders at the beginning of the fourth and fifth grades. Teacher warmth and permissiveness scores were derived from the fourth grade pupil responses and were now in the fifth grade. Fifth grade pupil achievement scores were grouped according to their fourth-grade teachers. The teachers were then divided into four groups--high permissive and high warmth, high warmth and low permissive, low warmth and high permissive, low warmth and low permissive.

Findings:

Vocabulary and arithmetic achievement growth were significantly greater for teachers scoring high on the warmth scale. No significant relationships were obtained for affect-need or permissiveness. Only the first hypothesis was partially supported.

Conclusions:

Since the study was exploratory in nature and the results inconclusive, no conclusions were drawn.

I-E-1

KIPNIS, D., "A Noncognitive Correlate of Performance Among Lower Aptitude Men", J. Applied Psychol., (1962), 1:76-80.

Purpose:

In the Navy, verbal, arithmetic, and mechanical aptitude tests are used to screen out potential failures, and at the same time leave enough men to fill all openings. Since aptitude tests are not infallible, some of the rejected men might have been successful if left in. It would be advantageous if men with marginally low aptitude scores who could succeed were identified by a secondary selection test.

The Hand Skill's Test was constructed as such a secondary test to measure noncognitive predictors of success. It attempts to measure "persistence beyond minimum standards". The test has been found to be a valid predictor of school grades and of supervisors evaluations of job performance in the Navy. The present study investigates whether the Hand Skills Test is equally useful as a predictor among high and low aptitude men.

Procedure:

Three groups of enlisted men, $N_1 = 120$, $N_2 = 122$, and $N_3 = 240$; and one group of officer candidates, $N_4 = 108$, were given the Hand Skills Test. This test seeks to measure motivation to persist beyond minimum standards on tiring tasks. It consists of sequentially numbered boxes in which subjects pencil five tally marks. The test rapidly causes hand and arm fatigue and is presented as a test of how rapidly people can move their fingers. It has a one minute practice session and three parts of four minutes each. A "passing score" is announced prior to each four minute part. The test seeks to differentiate between those who stop or slow down after the passing score is reached and those who strive on. The score used is number completed in Part Three minus number completed in Practice Session.

The General Classification Test (GCT) was used as an aptitude measure for the enlisted men and the Officer Qualification Test (OQT) was used for the officer candidates.

Final academic grade was used as measure of school performance for two enlisted groups and the officer group and eighth week grade average for the other enlisted group to permit earlier analysis.

Measures of job performance consisted of official performance ratings of the prior year and unofficial evaluations from each man's supervisor.

Results:

Based on their Hand Skills Test Scores, each sample was divided into Low persistence groups (bottom third) and High persistence groups (upper two-thirds). High and Low aptitude groups were formed by dividing into the bottom third on school grades and the upper two-thirds of school grades. Thus there were eight subgroups in each sample.

At each level of aptitude, phi coefficients were computed between dichotomized Hand Skills Test scores and number of men categorized as Below Average School and as Average School. These phi coefficients were significant for low aptitude enlisted men but not for high aptitude. Nor were they significant for any of the officer candidates.

A second set of phi correlations were computed between Hand Skills Test and Performance Evaluation at each aptitude level. Here significant coefficients were found for low aptitude groups in all four samples, but none were found for the high aptitude groups.

Conclusions:

In two of the enlisted groups, the Hand Skills Test identified men with lower GCT scores who were likely to succeed at school. In all four groups the HS test identified the lower aptitude men who succeeded on the job. No test validity was obtained among higher aptitude men in any sample either at school or on the job.

Assuming the validity of the Hand Skills Test, it appears that willingness to persist beyond minimum standards on tiring tasks is moderately related to school performance and strongly related to job performance of low aptitude men.

I-E-1

ROSENBERG, L. A., McHENRY, T. B., and ROSENBERG A. M., "Sociometric Ratings as Predictors of Academic Performance", J. Applied Psychol., (1962), 46, 4:265-268.

Purpose:
In a study by Wilkins, Rigby and Osoria (1959) a sociometric questionnaire was administered to a large number of WAVE recruits early in training. The scale consisted of several pairs of items, one positive and one negative in each pair, which dealt with different aspects of military performance and friendship preferences. The sociometric ratings discriminated between recruits who washed out, repeated basic training or were judged in lowest quarter of their company by two independent judges; and those judged to be in the upper quarter of their group. None of the ratings were correlated with objective grade average. The purpose of the present study was to cross validate these results using a male population and objective grade point average as criteria.

Procedure:
The subjects were 86 enlisted students in three military courses subsequent to basic training and a 2-8 week Army medical field activities course. After 12-14 days of the present course had elapsed, and prior to any academic examination, the sociometric questionnaire was administered. The questions were again seven pairs of items like those used in the study by Wilkins. An example of the type of item is as follows: "Which five students in your class do you think will perform best on the job?" The other item of this pair would phrase the question negatively.

Results:
The sociometric scores in this study consisted of the number of times a person was not mentioned in a positive statement minus the number of times mentioned in a negative statement. The first 12 items concerned job performance and the resultant score was called performance status; the last two items concerned adjustment status. The score obtained when all 14 items were treated in this manner was called the sociometric status.

The criterion scores were final academic grade averages, achieved in their respective courses. The three sociometric scores were correlated with academic grades with the following results: performance status, r = .40 (P = .01), adjustment status, r = .35 (P = .01), sociometric status, r = -.07 (m.s.). Further analysis on these two significantly correlated measures demonstrated that of the subjects ranked academically in upper quarter on performance status, 31.8% ranked in middle half, and 4.5% ranked in lower quarter on performance status.

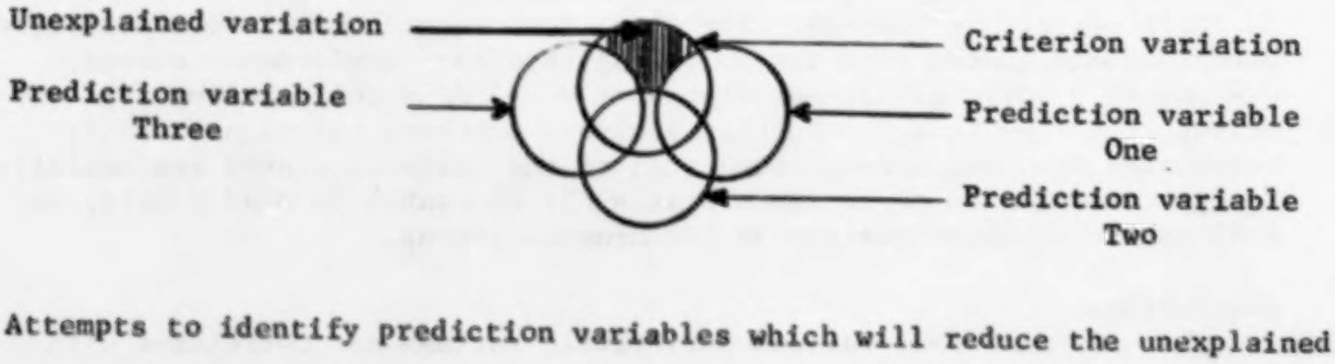
Conclusions:
Results show that various sociometric ratings are correlated with academic grades. However, the efficiency of this particular instrument is not very high and might produce considerable false predictions if used as a screening tool. The relationships appear to be restricted to the upper range of academic performance; the measures being unable to predict failing or below average performance.

## Criterion Group One Summary

Interpretive analysis of the research reports reviewed in Criterion Group One reveals that several methodological issues have implications for future media research involving nonintellective factors. Among these issues, two warrant special elaboration. These are designs involved and prediction variable specificity.

Experimental designs - Two general types of design have been employed to investigate the role of nonintellective factors in learning in Criterion Group One studies. One design is based upon typical correlational analysis and the other upon group comparison techniques.

In studies involving correlational analysis, it has been theorized that learning outcomes are related to one or more prediction variables available either prior to or during the learning experience. For example, it may be hypothesized that first-term collegiate grade point average is related to general scholastic aptitude and to other factors such as study skills and personal adjustment. The problem becomes one, then, of measuring each selected prediction variable and determining its relation to the criterion while systematically partialling out relationships between the criterion and other prediction variables. Schematically, this design can be represented as follows:



Attempts to identify prediction variables which will reduce the unexplained portion of the criterion variation are made in the research effort. Identification becomes increasingly difficult beyond three or four variables, however, since additional prediction variables are likely to correlate with some aspect of the criterion already being measured by other prediction variables.

When the correlational design is used, it is desirable to sample throughout the range of the variable studied rather than to mutilate the distribution by selecting from the extremes. When the distribution is mutilated the likelihood of the results of the study corss validating is greatly reduced and the assumptions underlying parametric analyses are violated.

Group comparisons in Criterion Group One studies constitute an attempt to duplicate the experimental method by manipulating assignment of subjects to groups rather than systematically varying an experimental treatment. In this design the treatment is assumed to be constant for all groups but the groups differ on some known variable. This design permits working with groups representing different profiles of characteristics. It is important for the investigator to recognize that he is assuming that the groups being compared differ on one identifiable variable, however. Too often, little consideration has been given to other characteristics of groups being compared than the variable being investigated. The group comparisons design will usually involve large numbers of cases because of the investigator's inability to insure comparability through either matching or covariance analysis.

Prediction variable specificity - Review of the research studies in Criterion Group One forcefully indicates that the more general the nature of the prediction variable, the less the likelihood that it will correlate with a heterogeneous criterion. This phenomenon is explainable in terms of the heterogeneity of the criterion, the unreliability of the specific aspects of the prediction variable measuring instrument, and the deviation from purpose for which many generalized scales have been constructed.

The criterion specific phenomenon is illustrated by the following example: General measures of personal adjustment, value, interests, and anxiety seldom yield high correlation coefficients with course grades when the keys designed for clinical uses are employed in their scoring. When criterion specific keys are constructed, however, their scores often increase predictive effectiveness to a significant extent. In addition, attitudes scales and biographical inventories designed specifically for a particular outcome more frequently relate significantly to a criterion than do similar measures designed for clinical uses. From a research standpoint, it is desirable to correlate only homegeneous prediction variables with a heterogeneous criterion. From a practical standpoint, however, it is desirable to maximize prediction without regard to factorial purity. There is a need for both approaches, but investigators should clearly state whether their aim is to isolate unique and identifiable portions of the criterion variation or simply to increase prediction. Obviously, the procedures for studying the relationships will vary for the two approaches.

## II. Criterion Group Two: Specific Course Outcomes

In Criterion Group Two, research studies involving specific course outcomes as the criterion or dependent variable have been classified. Most of these studies involve the relationship between teacher marks in one or more courses and certain nonintellective factors. In some studies the research has been replicated in various subject matter areas. In other studies, some criterion measure of performance other than course mark has been utilized. These criteria usually involve specific achievement test scores or specific course attrition. Illustrative titles in Group Two are the following:

"Extroversion, Neuroticism, and Student Achievement in Introductory Psychology"

"An Index of Industriousness for English"

"The Effect of Attitude on Performance in Mathematics"

"Factors Related to Reading Achievement of College Freshmen"

"Factors Contributing to the Study of First Semester College German"

"Cognitive and Noncognitive Predictors of Achievement in Student Nursing"

"High School Science Achievement as Related to Interest and I.Q."

II-A-1

BENDIG, A. W., "Extraversion, Neuroticism, and Student Achievement in Introductory Psychology", J. Educ. Res., (1960), 53:263-267.

Purpose:

To study the relationship between extraversion, neuroticism and student achievement when intra-individual achievement fluctuation is controlled. The validity coefficient of the scale should be higher for low fluctuation Ss (for whom the achievement level criterion measure is more reliable) than it is for high fluctuation Ss.

Method:

Subjects: 202 undergraduate males.

Scales: 1. A vocabulary test containing 30 multiple-choice synonym items taken from the Cooperative Vocabulary Test.

2. The Maudsley Personality Inventory.

Procedure:

Four 40-item multiple-choice examinations were administered during the semester and two achievement criteria were derived from these scores. The scores for all Ss on one examination were pooled and converted to standard scores.

A measure of achievement fluctuation was obtained by finding the range between the highest and lowest standard score received by an Ss over the four exams, multiplying this range by the conversion factor given by Dixon and Massey, to provide an estimate of the variance of the Ss examination scores, and extracting the square root of this variance estimate to provide a more normally distributed variable.

The criteria variables of level and fluctuation were intercorrelated by both rectilinear and curvilinear techniques.

The four subgroups of Ss with smaller fluctuation measures consisted of the low fluctuation group (101 Ss), and the four subgroups of Ss with larger fluctuation measures constituted the "high" group (101 Ss).

The three predictor scales were correlated with achievement level for the total group. The scales were correlated separately for the low and high fluctuation subgroups.

Results and Conclusions:

The vocabulary scale was moderately related (r = .43) to achievement level for the total group and also within the fluctuation subgroups. The Neuroticism Scale was unrelated to achievement. The Extraversion Scale correlated significantly with achievement for the total group (r = .17) and within the low fluctuation subgroup (r = -.11) was not significant. The multiple r of vocabulary and extraversion with achievement (.48) was significantly larger than the vocabulary-achievement zero-order correlation within the low fluctuation subgroup.

Discussion:

The results of this study confirm the presence of a curvilinear relationship between achievement level and achievement fluctuation. The lack of relationship between the Neuroticism Scale and the achievement criterion for the total group, or within either of the two fluctuation subgroups, demonstrates the independence of the neuroticism dimension and academic performance.

II-A-1

BENDIG, A. W., "Predictive and Postdictive Validity of Need Achievement Measures", J. Educ. Res., (1958), 52:119-120.

Purpose:

One-hundred-and-ten male students enrolled in six sections of introductory psychology for whom complete achievement and psychometric data were available.

Three psychometric scales were administered to the students during two class sessions within the first four weeks of the semester: (a) a 30-item vocabulary test used as a measure of the verbal intelligence level of the students, (b) the 28-item forced-choice Need Achievement scale included in the Edwards Personal Preference Schedule, (c) the four-picture projective Need Achievement measure developed by McClelland (administered in classroom using "neutral" instructions and scored by two experienced administrators.

Criteria:

The two achievement criteria available on each student: (a) each student filled out a "census card" at the beginning of the semester which requested his cumulative quality grade point average (QPA) in all courses completed at this university during the student's preceding semester, (b) the letter grade received at the end of the semester. Also, the student's relative performance on four objective departmental tests administered during the semester to all students in the course.

Results:

Raw scores on the three test measures and the two achievement criteria were approximately normally distributed. The variables were intercorrelated by the product-moment method. "The significance of the difference between the two validity coefficients for each of the psychometric scales (the correlation on the test with the two achievement criteria) was tested for significance by the F-ratio method, which statistically controls for the correlation (4 = .41) between the two achievement criteria."

The vocabulary relation between vocabulary and course grades was found to be r = .27. The correlation between Edwards Need Achievement Scale and QPA was r = .17 (sig. at .10 level) but lower when correlated with course grades (r = .13). The difference between these two correlations was significant at the .01 level. McClelland's Need Achievement scale was significantly (.05 level) related to QPA (r = .22) but showed a zero relationship (r = .02) to grades. The difference between these two validity coefficients was significant at the .10 level. Adding either of the two Need Achievement scales to the QPA measure by multiple correlation technique did not significantly improve the accuracy in predicting course grades (r = .42) over the use of QPA measure alone (r = .41).

Conclusion:

The original McClelland hypothesis that "the projective measure of Need Achievement is more highly related to future achievement than it is to past achievement" was not confirmed. This study suggests that the

**opposite is true. "Achievement imagery may be the result of the past reinforcement history of students and not an index of the current motivational level of the students. Positive academic reinforcement may act to strengthen the occurrence of achievement trends in the fantasy productions of students.**

II-A-1

CALVIN, A. D., McGUIGAN, F. J., and SULLIVAN, M. W., "A Further Investigation of the Relationship Between Anxiety and Classroom Examination Performance", J. Educ. Psychol., (1957), 48:240-244.

Purpose:

This study was designed to test the hypothesis that tension is built up throughout the process of taking an objective examination and that giving the opportunity to comment reduces the increasing tension.

Subjects:

The subjects for the study were 158 undergraduate women taken from classes in Introductory Psychology, Introductory Spanish, and Spanish Literature. In each case the entire class participated.

Procedure:

At the beginning of each course each subject was given the Taylor Manifest Anxiety Scale and the Otis Higher Examination of Mental Abilities Test. Each class was randomly divided into an experimental and a control group. The experimental examination was the first in the course. The experimental group was instructed to feel free to make any comments about the items. The control group was instructed not to mark on the paper other than to give the answer. The largest Psychology class (n = 61) was divided at the median into low and high anxiety groups.

Findings:

1. In all five classes the experimental group made fewer errors on the last half of the examination than did the control group. The difference for each class was not significant but when the classes were combined the difference was significant at the .03 level.
2. For the largest Psychology class the high anxious group was significantly superior to the low anxious group (.005 level). There was a sharp reduction in errors for the high anxiety experimental group and a slight increase in errors for the low anxiety experimental group on both the first and second half of the test.
3. Students who made the most comments made the least errors. The correlation between the total number of comments and the number of errors on the second half was -0.19 for the high anxiety experimental group and -0.40 for the low anxiety group.
4. The correlation between the Otis scores and the anxiety score was -.05.

Conclusions:

The hypothesis is supported - tension apparently does build up in taking an objective examination and this tension can be reduced by making comments on the items.

II-A-1

DEY, R. G., "Prediction of Achievement Using N-Achievement Scores Obtained Under Neutral and Achievement Conditions in Conjuction with Measures of Aptitude and Self-Rating Discrepancies", Ed. D. Dissertation, Dept. of Educational Psychology and Measurements, University of Nebraska, (1960).

Purpose:

The purpose of this study was to investigate the use of n-achievement scores combined with a measure of scholastic aptitude in the prediction of academic achievement.

Setting:

The sample used in this study consisted of 140 students in Ed 30 at the University of Nebraska. There were 70 male and 70 female subjects. There was a division of the sample into two groups - one control and one experimental. They were matched according to sex and aptitude scores. Each of the final groups was composed of 35 male and 35 female subjects.

Experimental Procedure:

The design for the securing of n-achievement under neutral and achievement conditions was as follows: Under neutral conditions where there was no reference to achievement, all individuals wrote stories describing the theme depicted by the pictures in the McClelland procedure. Pictures were presented on slides. The subjects were paced to insure complete coverage of the questions. The giving of n-achievement under neutral conditions was to establish the n-achievement levels prior to experimental manipulation so that the effect of situational conditions on n-achievement could be determined.

One week later a reassessment of n-achievement under varying conditions was undertaken. Multiple sections and additional test administrators allowed simultaneous assessment of the control and experimental group. The reassessment of n-achievement for the control group (neutral condition) was done in the same manner as the initial assessment of n-achievement.

The procedure for reassessment of n-achievement for the experimental group involved creation of an achievement-cued situation prior to the presentation of the pictures. This was done by completion of a Q-sort for the ideal student followed by a Q-sort in describing themselves as a student. Completion of the Q-sorts was followed by presentation of the pictures the same as with the control group in the reassessment of n-achievement. The Q-sort was completed by the control group at the end of the testing session.

Further analysis of the relevancy of n-achievement was conducted using a grouping on the basis of sex. The discrepancy between perceived ideal and perceived self as a student was evaluated in terms of its possible relevance in predicting grade point averages in various combinations with the other prediction variables. Regression equations were used to ascertain gains made other than from the aptitude prediction scheme. The significance of these gains was determined by using the F Test. The significance of differences between group means was by the T Test.

Results:

The results can best be depicted in terms of the three basic hypotheses tested in this study: (1) The addition of n-achievement scores of ACE-L scores will not produce a significant change in the amount of this study, this null hypothesis could not be rejected.

(2) Sorting of affective laden statements in a Q-sort to provide the best description of perceived real-self and self-ideal as a student will be used to produce an achievement cued situation for the experimental group. The mean level of n-achievement scores obtained under these conditions will not differ from the mean level of n-achievement scores obtained under neutral conditions from the control group.

Testing of the differences between groups indicated that this null hypothesis could not be rejected.

(3) Retest n-achievement scores obtained under achievement cued conditions will not provide a more relevant measure than retest n-achievement scores obtained under neutral conditions in the amount of variance accounted for in grade point averages.

On the basis of the test of differences between groups, this null hypothesis could not be rejected.

Conclusions:

On the basis of this study, n-achievement, if reflecting motivation related to achievement, did not present a consistent relevant measure useful in accounting for variance in grade point averages.

Exposure to an achievement cued situation prior to assessment of n-achievement resulted in a significant mean increase in achievement imagery. The increase in level of achievement imagery was not reflected in a like increase in prediction validity. Loss of validity in both the neutral and cued situation suggested that the obtained increase in achievement imagery reflects situational pressure rather than heightened need achievement.

II-A-1

EHRLICH, H. J., "Dogmatism and Learning", J. Abnorm. Soc. Psychol., (1961), 62:148-149.

Purpose:

To investigate the validity of certain aspects of the construct of dogmatism. To demonstrate the role of personality factors in a learning situation.

Definition of Dogmatism by Rokeach: "A relatively closed cognitive organization of beliefs and disbeliefs about reality, organized around a central set of beliefs about absolute authority which, in turn, provides a framework for patterns of intolerance and qualified tolerance toward others."

Setting:

Students who enrolled in sociology were the subjects. The sample of subjects started at 100 and was limited to 57 because the third administration was by mail. Scores on the OSPE (Ohio State Psychological Examination) were available for all students.

During the first week of the academic quarter the subjects were given the Rokeach Dogmatism Scale (1957) and a 40-item true-false test of sociological knowledge. The sociology test was readministered during the last week of the quarter (time lag of 10 weeks). Five months later the dogmatism scale and the sociology test were mailed to the original subjects. Fifty-seven were returned complete. Split-half reliability of the dogmatism scale was .75. The correlation between the two administrations (separated by 5-6 months) was .73.

Findings:

Intercorrelations between dogmatism, OSPE and sociology test scores:

TABLE 1

| | OSPE | Sociology Test | | |
|---|---|---|---|---|
| | | Time 1 | Time 2 | Time 3 |
| Dogmatism | -.28 | -.30 | -.52 | -.54 |
| OSPE | | .27 | .32 | .36 |
| Soc. test (t1) | | | .66 | .63 |
| Soc. test (t2) | | | | .89 |

TABLE 2

| | Partial r with Dogmatism, OSPE Constant | Partial r with OSPE, Dogmatism Constant |
|---|---|---|
| Soc. (t1) | -.24 | .20 |
| Soc. (t2) | -.48 | .21 |
| Soc. (t3) | -.49 | .26 |

TABLE 3

| | Partial r with Dogmatism, OSPE and Initial Test Scores Constant | Partial r with OSPE, Dogmatism and Initial Test Scores Constant |
|---|---|---|
| Soc. (t1) | -.43 | .12 |
| Soc. (t2) | -.45 | .18 |

**Conclusions:**

**Dogmatism yielded an inverse relationship and OSPE a direct relationship to learning in all three periods. Table 2 demonstrated Dogmatism can account for a greater proportion of the variance in the sociology test scores than OSPE.**

**Subjects low in dogmatism entered the sociology classroom with a higher level of learning, learned more as a result of classroom exposure, and retained this information to a significantly greater degree than the more dogmatic subjects.**

II-A-1

KAZMIER, L. J. , "Cross Validation Groups, Extreme Groups and the Prediction of Academic Success", J. Educ. Psychol., (1961), 52: 195-198.

Purpose:

This study was designed to investigate the relationship between the EPPS scales and a criterion of academic achievement when scores of all subjects are utilized, not just those of selected extreme groups.

Subjects:

The subjects were 140 students enrolled in Introductory Psychology at Ohio State University.

Procedure:

Each subject was given the EPPS scale and 36 questions pertaining to six paragraphs taken from the Ohio State University Psychological Examination which were used as a predictor of success in the course. The criterion of success was the total number of points accumulated on three examinations and four quizzes.

The subjects were divided into two groups - an experimental group and a cross-validation group. The groups were comparable in terms of sex, standing on the reading comprehension test, and the criterion and the 15 EPPS scores. The correlation of each of the 15 scales with the criterion of success was determined for each of the groups and for the entire sample. The Wherry-Doolittle test selection techinque was then applied to the experimental group in order to determine the best selection and weighting of the EPPS scales for maximum predictiveness. A composite r was then computed for the cross-validation group using the scales and weights derived from the experimental group.

Findings:

1. The split half reliability coefficient for the reading comprehension test was .813. The coefficient of correlation between this and the criterion was .593 which is significant at the .001 level. 2. Significant correlation coefficients between the EPPS variables and the criterion were: for the experimental group - succorance and dominance at the .10 level, and change at the .05 level; for the cross-validation group - order and dominance were significant at the .10 level, and for the total sample - achievement, nurturance and affiliation were significant at the .10 level and dominance was significant at the .05 level. 3. Using the Wherry-Doolittle test selection method, a multiple regression equation was obtained using the EPPS variables change, succorance and heterosexuality which correlated .345 for the cross-validation group.

Conclusions:

The predictive validity of the EPPS variables evidenced for one group is not necessarily generalizable from one group to another.

II-A-1

KRATHWOHL, W. C., "An Index of Industriousness for English", J. Educ. Psychol., (1949), 40:469-481.

Purpose:

The purpose of this study was to construct an index of industriousness for achievement in English where "Industriousness" refers to the student who is an overachiever, and the underachiever is referred to as "indolent."

Procedure:

Scores were obtained from 308 sophomores on each of the following tests: the Reading Comprehension Test, the Mechanics of Expression Test, and the English Expression Test. The students were then divided into three groups according to industriousness index. Correlation coefficients were computed between scores on the English Expression Test and industriousness index.

Results and Conclusions:

When the scores in the English Test for the normal and indolent groups were compared the normal group scored significantly higher. When the scores for the normal and industrious groups were compared the industrious group scored higher.

The results show for a given degree of brightness in English there is a generally substantial correlation between success in English and work habits.

II-A-1

SMITH, D., and WOOD, R. L., "Noncognitive Personality Dimensions as Indices of Reading Improvement at the College Level", The American Psychologist.

Purpose:

To test the hypothesis that college students differing in rate of progress toward improved reading will differ also in known noncognitive personality dimensions.

Procedure:

Subjects consisted of two groups of 95 subjects each selected from freshmen college reading improvement classes on the basis of slow or rapid imporvement in rate of comprehension during a six-weeks period. Rate of progress was defined as the slope of the midpoints between reading rate and rate of comprehension on two series of speeded readings administered weekly. Cattell's 16 P.F. Test, purporting to measure 16 orthogonal personality dimensions, yielded global personality profiles. Coefficients of profile similarity were found for each subject with every other subject. Cluster analysis by inspection of the resulting matrix indicated groups of similar subjects. Scholastic aptitude and initial reading skills were inferred from the ACE, Q and L scores, and the Cooperative Reading Test, V, L, and S scores.

Results:

Group means in scholastic aptitude and initial reading skills were virtually identified whereas mean rate of progress differed by 3:1. Group means differed significantly on 4 of 16 dimensions with two others questionable. Coefficients varied from .77 to -.66. Cluster analysis yielded four factors (profile groups) which paralleled Eyschenk's introversion-extroversion and neurotic dimensions as well as Tewinion-type-rigidity-stability formulation of the senior author. Clusters were significantly differentiated by P.F. x 16 scores relating to rigidity-stability syndromes. Traits included strength of will, "free anxiety", overt emotionality, and alertness.

Conclusions:

The hypothesis that college students differing in rate of reading comprehension will also differ in noncognitive personality dimensions is confirmed. Results indicate a strong possibility that progress in reading improvement at college level is predictable from scores on available instruments. The feasibility of techniques of reading therapy based on congruence of clusters with stable and neurotic personality typology can be elaborated.

II-A-2

AIKEN, L. Jr., DREGER, R. M., "The Effect of Attitudes on Performance in Mathematics", J. Educ. Psych., (1961), 52:19-24.

Purpose:

This study was designed to test the hypothesis that direct experiences in relation to mathematics contribute to math attitudes and that these attitudes contribute significantly to math grades. It was also hypothesized that math attitudes are not related to general numerical ability.

Subjects:

The subjects for the study were students taking general math and algebra at a southeastern university. The exact number was not stated.

Procedure:

The subjects were given a series of tests which included the Math Attitude Scale (MAS), the Minnesota Counseling Inventory (MCI), the Intensive Personal Data Sheet (IPDS), Cooperative Mathematics Pretest for College Students (CMP) and the DAT tests of verbal reasoning, numerical ability and abstract reasoning. High school math averages and math grades in the course were also obtained. The data were analyzed primarily by means of multiple and partial correlation and regression methods.

Results:

1. The multiple correlation coefficient between the predictor variables (DAT, MAS and high school average) and the criterion (grades) for the basic math classes was .67 for males and .63 for females. When the predictor equations were applied to the algebra classes, the coefficients of correlation were .65 for the females and .69 for the males. Tests of significance for the partial regression coefficients in the original equation showed that for males all variables except Math Attitude made significant contributions. For females only Math Attitude and DAT numerical ability made significant contributions.
2. A multiple regression equation was developed to predict scores on a retest with the CMP, using Math Attitude and CMP pretest scores. Partialling out the effects of the initial scores, correlations of .33 for males and .34 for females were obtained. Both were significant at the .02 level.
3. To test the hypothesis that general personality variables are not related to math attitude, multiple regression equations were carried out combining MAC scores with DAT scores with the criterion being Math Attitude. The largest part of the variance was accounted for by DAT numerical ability; however, MCI leadership was significantly correlated (r = -.21) with Math attitude for males.
4. Confirmation of the hypothesis that math attitudes are positively related to numerical ability was found in the significant partial correlations between DAT numerical ability and Math Attitude scale scores when the other two DAT tests were partialed out. These coefficients were .23 for females and .51 for males.

5. Correlations were obtained between the rating scales on the IPDS concerning remembered characteristics of teachers and the Math Attitudes scale. Significant correlations were obtained for males for patient vs. impatient (.34) and hostile vs. friendly (.22). For females significant correlations were found for patient vs. impatient (.34) and fair vs. unfair (.31), clever vs. dull (.26), brutal vs. kind (.21) lots of fun vs. grim (.27), knew their subject well vs. lacking in knowledge of the subject (.34), and knew how to teach math vs. did not know how to teach math (.31).
6. No significant correlations were obtained for the items on the IPSD measuring parent attitude toward math and the student attitude scale.
7. No significant correlation was found between remembered traumatic experiences and scores on the Math Attitude Scale.

Conclusions:

1. Math attitudes are apparently related to intellective factors and achievement.
2. Math attitudes are not related to temperament variables.
3. Experiences with former math teachers are somewhat related to math attitudes.

II-A-2

BENDIG, A. W., "The Relation of Level of Course Achievement to Students' Instructor and Class Ratings in Introductory Psychology", Educ. Psychol. Measmt., (1953), 13:437-447.

Purpose:

The research was to test whether any significant relation is present between students' known level of course achievement and ratings of their instructor and of the course in Introductory Psychology.

Procedure:

For each of the 132 students in the study the following data was gathered: name of the instructor he had had during the course in Introductory Psychology, the sum of his standard scores on three achievement tests during the course, the sum of his ratings of his instructor on the first ten scales of the Purdue Rating Scale for Instructors, and the sum of his ratings of the course of thirteen other scales of the Purdue Scale.

Results:

Analysis of variance showed the difference between classes in their rating of instructors and courses to be significant at the .001 level. The differences between classes on summer achievement scores were not significant at the .05 level and gave no indication that any real differences existed between classes on this variable.

Analysis of covariance, holding achievement constant, showed that the differences among classes in ratings of instructor and courses were still significant at the .001 level. This analysis also showed that it is indefensible to pool the raw data from the five classes in determining correlations between achievement and ratings of instructor and course. In further analysis it was found that the significant deviations from the average regression line, from pooling all data, could not be attributed to the non-rectilinear relations between class achievement and mean class instructor rating. A final analysis of the correlation of the achievement measure with instructor rating and course rating for each class separately and average correlation of all classes, produced r's of -.263 to .370 with instructors' rating, r's of .070 to .456 for course rating, and averages of .140 and .281, respectively. Only the top correlation for each type of rating was significant at the .05 level, and only average correlation of achievement with course rating was significant.

Conclusions:

Previous conclusions that course achievement has little or no effect on expressed evaluation of course and instructors are not supported by this study.

II-A-2

BOSTROM, R. N., VLANDIS, J. W., and ROSENBAUM, M. E., "Grades as Reinforcing Contingencies and Attitude Change", J. Educ. Psychol., (1961) 52:112-115.

Purpose:

This study was designed to study the effect on attitudes of differential assignment of grades for performance on attitude related essays.

Subjects:

The subjects for this study were 228 students enrolled in Communication Skills classes at the State University of Iowa.

Procedure:

All subjects were given attitude scales measuring attitudes toward legalized gambling and socialized medicine. Six weeks later each subject was asked to write an essay on one of the topics supporting the position opposite to that indicated by his pretest score. On a random basis, grades were assigned to the essays. One-third received a grade of A, one-third a grade of D and one-third were given no grade. Immediately after the essays were returned the attitude scales were readministered and the subjects were to indicate their satisfaction with the grades. The change in attitude was determined by subtracting the subject's score on the post-test from his score on the pretest.

Findings:

(1) Subjects receiving an A changed on average of 31.76 points in the direction of their essays while subjects who received a D changed 25.85 points. The difference was significant at the .01 level.

(2) The attitudes of subjects who were given an A changed significantly (.05 level) more than those who received no grade.

(3) There was no significant difference in the attitude change of those who received a D and those who received no grade.

(4) Subjects who had initially assumed a favorable position on the issue changed significantly (.01 level) more than those who took an unfavorable position.

Conclusions:

A good grade serves to reinforce the behavior for which it has been administered.

II-A-2

HURLEY, J. R., "Achievement Pressure: An Attitudinal Correlate of College Course Grades", Psychol. Reports, (1962), 10:695-702.

Purpose:

The present studies evolved from preliminary evidence of a substantial inverse relationship between college students scores on an attitudinal index, provisionally labelled achievement pressure (AP), and their grades in psychology courses. These investigations were aimed at outlining the scope of this phenomenon and the clarification of the relationships between AP and course grades were scrutinized in three college courses, taught by different instructors and using different evaluations for performance. The role of IQ was appraised by assessing the relationships among measures of college aptitude, AP scores and course performance.

Method:

Achievement Pressure (AP) Index - The statements contributing to the AP score were selected to represent a variety of concrete ways in which children might be pushed toward the acquisition of social skills. These items were interspersed among items in the Child Behavior Inventory on child-rearing practices. Response alternatives were of a Likert type. The overall AP score was derived from the total AP points accrued by responses to the series of 27 AP statements. Two distinctive subgroups were employed to insure that extreme AP scores could be obtained only by systematically agreeing with certain items while disagreeing with others.

College Aptitude Measures - Total scores of the Psychological Examination of the American Council on Education (ACE) were used as the intellectual ability index in studies A and B. In study C, the total scores on the College Qualificantions Test (CQT) form B were utilized which correlated .78 with ACE total scores. These scores were grouped into 10 categories on the basis of local norms. In all instances the measure of academic performance utilized was the cumulative total of quiz points, examination scores, or instructor's ratings which were traditionally used to determine course grades. In each study, the CBI was administered to the students during the first week of the term.

Study A - The CBI was given to two sections of abnormal psychology classes and the subjects completed them outside of class and returned them with their own personal coding system for identifying their own CBI. Three quizzes were given over the term and the score for the term being the summation of all. The same quizzes were given to both sections. At the end of the term, 44 females and 22 males identified their code numbers.

Study B - This investigation was undertaken primarily to check the results of Study A. The CBI was administered by a different instructor in a Child Psychology class and the subjects gave their names on the response forms.

Study C - The purpose of this investigation was to ascertain whether AP scores would be related to performance in a subject matter other than Psychology. In this course, communication skills, performance was measured jointly by a combination of instructors' ratings for written papers and class recitations and an objective final examination.

## Results:

Because no significant differences were found between the final grades earned by male and female students in any of these studies, the data for both sexes were grouped together.

The results indicated a highly reliable inverse relationship between AP scores and the college course grades indices. These negative correlations compared favorably in magnitude with those found between the same course grades and college aptitude measures. The AP index correlated so slightly with the aptitude measures, however, that partialling out the influence of the aptitude indices from the corr correlations between AP scores and course grades did not appreciably modify the outcome.

## Summary:

An attitudinal measure of the construct of achievement pressure (AP), defined as the tendency to impose social achievement demands on children, was described which correlated about -.40 with the grades earned by college students in three different courses.

This AP index was essentially unrelated to IQ as measured by aptitude tests and r's between AP and course grades rivaled those between grades and the aptitude indices. Thus college students expressing a stronger inclination in their questionnaire responses to exert achievement pressures upon children tended to be inferior in college grades, but not in IQ, to students manifesting a lesser tendency to make achievement demands of children. If it is assumed that the student's AP scores are directly related to achievement pressure exerted by their parents, these results are inconsistent with prior reports that parental achievement pressure facilitates scholastic success at subcollege levels.

II-A-2

RUSSELL, H. E., and BENDIG, A. W., "An Investigation of Student Ratings of Psychology Instructors to Their Course Achievement When Academic Aptitude is Controlled", Educ. Psychol. Measmt., (1953), 13:626-635.

Purpose:

This study was designed to find what relationship, if any, exists between a student's rating of his instructor and his achievement in the course, when aptitude is held constant.

Procedure:

A regression equation to predict letter grades of students in an Introductory Psychology course was developed using Q and L scores of the American Council of Education Psychological Examination (ACE) as predictors. The equation was based on data of 1103 students who had previously completed the course and had taken the ACE.

Grades were predicted for 231 students in five sections of Introductory Psychology. They were then divided into three groups on the basis of differences between predicted and obtained grade. The "plus" group consisted of those students whose obtained grade was more than one half standard error of estimate above predicted grade. The "equal" group were those with obtained grade average within one half standard error of estimate of predicted grade. The "minus" group fell over one half standard error of estimate below predicted grade. The subjects each rated their instructor on the Miami Instructor Rating Sheet.

Results:

Analysis of students ratings of their instructors on the Miami Sheet indicated that no overall difference existed between "plus" and "minus" groups in their rating instructors, but the relative achievement (residual when aptitude is held constant) affected simple scales on the Miami. Significantly more favorable ratings were given by the "plus" groups on rating scales measuring attitude toward course, but relative achievement had little affect on student attitudes toward the instructors. Little relation was found between measures of instructor effectiveness derived from pooled measures of their relative achievement.

Implications:

There appears to be some relation between achievement and attitude toward course. It is difficult to tell yet which is the cause and which is the effect. But if we hypothesize achievement is affected by attitude toward course, the hypothesis could be tested, by measuring attitude before the fact. If the casual relationship was supported we would be looking at a possibly important non-intellective factor in academic achievement. The role of media as far as such an attitude factor is concerned would be the basis for further hypothesis. Would a new media influence students attitude toward the course? For how long and in which direction? Should the new media just be used on those with unfavorable attitudes, etc?

II-A-3

McNEE, M. A., "Factors Related to Reading Achievement of College Freshmen", Thesis, Universtiy of Chicago, Chicago, Ill., August 1961.

Purpose:

The purpose was to determine the relationship of education and social factors to the reading achievement of two hundred fifty-seven college freshmen enrolled at the University of Chicago in 1930.

Procedure:

Correlations were made on data already available at the University. Correlations were made on: intelligence and reading ability, high school achievement and reading achievement, high school class rank and reading test scores, and personal data and reading scores. The best 32 readers according to the reading test scores were compared with the 38 worst readers in the various factors included in the study.

Results:

There was a high correlation between reading and intelligence, but both tests are dependent on reading ability. There was a high correlation in the other factors as well. For personal data the subjects with the higher socio-economic backgrounds did better.

Conclusions:

Intelligence is significantly correlated with reading achievement for both men and women. Scores on high school achievement tests correlate more highly with reading test scores than do high school marks.

II-A-4

ROMNEY, A. K., "The Kuder Literary Scale as Related to Achievement
in College English", J. Applied Psychol., (1950), 34:40-41.

Purpose:

Though most of the studies conducted to investigate the relation between Kuder interests and achievement showed positive relationships, they were done mainly with small groups using college grades as a criterion of achievement. The present study is concerned with reporting results obtained using a precise index of achievement on a fairly homogeneous group of over a thousand subjects.

Procedure:

Three scores were obtained on each of the 1085 subjects (566 male, 519 female). The subjects were all new students at Brigham Young University. The subjects were all exposed to nearly the same amoung of instruction during the first quarter. During the quarter each instructor taught classes in which students had been assigned according to their performance on the Purdue English Placement Test. Thus each instructor taught some good classes, some poor, and some intermediate classes. This equalized the teaching factor as nearly as possible. Achievement was then measured by a rather long (554 item) objective achievement test given at the end of the fall quarter. Scores of each subject on the Kuder Literary Scale and the ACE, 1947 edition, were obtained from the counseling service.

Results:

The Kuder Literary Scale had a small but statistically significant correlation with English Achievement of about .30 for both male and female. This did not rise significantly when possible effects of ACE were partialed out.

The correlation between ACE and English achievement was high for both males and females, .69 and .84 respectively. When a multiple correlation was accomplished it was evident that no significant change resulted from addition of the Kuder Literary Scale. Thus it was noted that the Kuder scale and the ACE are apparently independent of each other.

Conclusions:

It was concluded that as far as these data were concerned, the correlation between achievement in a college English class and the Kuder Literary Scale is very low even though significant.

II-A-4

WINTER, W. D., "Values and Acheivement in a Freshman Psychology Course", J. Educ. Res., (1961), 54:183-186.

Purpose:

To measure the similarity in values between a group of college students and their instructor, and to relate this similarity to their academic achievement in his class.

Method:

The subjects of this study were 34 freshmen, taught by a male instructor. This was the instructor's first teaching experience.

A modified form of the Semantic Differential, as described by Osgood, was the instrument used to measure values. In the present study, the students were asked to rate fifteen concepts according to eight adjective pairs. One member of the adjective pair was placed at one end of a seven-point scale, the other member at the opposite end. The students indicated the direction of their judgment (1-7).

When the students had finished, they were given another copy of the test and told to predict the responses that their instructor had given.

Their entrance ACE scores and their final ranking in the course, based on test grades, were obtained at the end of the semester.

For each student, the total value score for any given concept was subtracted from the value score given to it by the instructor. The overall value discrepancy between student and instructor was called the student-professor score.

Results:

Grade achievement was significantly related to the ACE - Linguistic and total scores and to the degree of similarity in values between student and professor. In addition, grades were also significantly correlated with the student's ability to correctly predict his instructor's values.

The two best predictors of class achievement were the Student-Professor discrepancy and academic aptitude measures appeared to be distinct variables, although each correlated with grades.

The ability to judge the professor correctly was related to intellectual and aptitude factors, as well as to achievement and to similarity between student and professor in values.

Summary:

The findings of this study are that grades achieved in this class are significantly correlated with:

1. The similarity in values between professor and student.
2. The student's ability to predict the professor's values correctly.
3. The student's scores on the ACE - Linguistic and ACE-Total Scales.

II-A-5

BRIGGS, Arvella, and JOHNSON, D. M., "A Note on the Relation Between Persistence and Achievement on the Final Examination", J. Educ. Psychol., (1942), 33:623-627.

Purpose:

This study was designed to answer the question: are good students more persistent and do they work longer on the final examination than poor students?

Subjects:

The subjects for the study were 101 students in three elementary psychology classes.

Procedure:

Students in the three classes were given similar final examinations consisting of 115 and 116 multiple choice items. The papers were kept in the order in which the students returned them, then each class was divided into thirds according to this order. Mean scores for each third were computed and analysis of variance was used to determine the significance of the differences. In order to evaluate the effects of intelligence, Henmon-Nelson scores were obtained and the average intelligence test scores for each third of each class were computed. In order to determine the effects of non-intellectual factors, an index of achievement on the basis of intelligence test scores and subtracting his actual achievement from his predicted achievement. A negative index indicates underachievement.

A check of the results was made by using the same methods to evaluate performance on the Graduate Record Examination (GRE) of 86 seniors.

Results:

1. The psychology test scores for the three groups formed a U shaped distribution with the first and last thirds scoring higher than the middle third. The F ratio was not significant.
2. The same U distribution was found for the intelligence scores of the three groups.
3. The mean indices of achievement for the first third of each class to finish was negative. The index was negative for the middle group and was negative for two of the three classes, and the mean index for the last group to finish was positive in all cases.
4. The performance of seniors on Book I of the GRE confirmed the results. Their performance on Book II did not.

Conclusions:

1. The results indicate that those who turn in their examination papers among the first third and those who persist and hand in their papers among the last third are better students.
2. The superior achievement of those who work longer on an examination is due, at least in part, to greater persistence.

II-A-5

KRATHWHOL, W. C., "Relative Contributions of Aptitude and Work Habits to Achievement in College Mathematics", J. Educ. Psychol., (1953), 44:146-148.

Purpose:

This study investigated the hypothesis that an index of industriousness (study habits) for mathematics can be obtained by subtracting the score an individual obtains on an achievement test from his score on a mathematics aptitude test, and that this index can improve prediction of achievement in mathematics.

Subjects:

The subjects were 859 freshmen at Illinois Institute of Technology.

Procedure:

The index of industriousness (II) was obtained by subtracting each subject's score on the Mathematic Preparation Test (MPT) developed at Illinois Institute of Technology. Product-moment and multiple correlations were then obtained between College Algebra grades (CAG) and IMAT, CAG and II, CAG and IMAT and II, IMAT and II. Correlations were computed separately for all subjects, subjects grouped according to ability, and subjects grouped according to industriousness.

Findings:

For all subjects the correlations were IMAT and CAG .46; II and CAG .08; II and IMAT -.51; II, IMAT and CAG .59. When the subjects were grouped according to ability the correlations were: for the above average group - II and CAG .41; II, IMAT and CAG .53; for the average group - II and CAG .37, II, IMAT and CAG .42; for the below average group - II and CAG .21, II, IMAT and CAG .37.

When the subjects were grouped according to industriousness, the correlations were: for the industrious group - II and CAG -.08, II, IMAT and CAG .56; for the normal group - II and CAG .08, II, IMAT and CAG .62; for the indolent group - II and CAG .15, II, IMAT and CAG .58.

Conclusions:

The industriousness index makes a significant contribution to the prediction of grades in multiple correlation equations. There is a greater tendency for the below average group to compensate for their lack of ability by means of increased industriousness in mathematics. Mathematics aptitude contributes much more toward success in college algebra than work habits. When the group is considered as a whole, predictions for achievement are independent of work habits and the contribution of indices of industriousness is negligible.

II-A-5

LARSON, R. P., WITTENBORN, J. R., and CIESECKE, E. G., "Factors Contributing to Achievement in the Study of First Semester College German", *J*. *Exper*. *Educ*., (1941-42), 10:265-271.

Purpose:

To investigate the importance of factors commonly believed to be pertinent to success in the study of first semester German at the University of Illinois.

Procedure:

A battery of tests (Freshman Guidance Exams) were administered to 130 Freshmen at the beginning of the study which included the following: (1) English Training, (2) Iowa Placement Exams, (3) Foreign Language Aptitude, (4) Iowa High School Content Exam, (5) Iowa Silent Reading Tests (New Edition).

Additional tests given during the first week of the second semester were as follows: (1) measuring rote memory (Work Number, Initials Recall, Auditory Word-Number, and Auditory Initials Recall), (2) visual perception tests (Scattered X's and Backward Writing), (3) test involving reasoning (Number Patterns and Syllogisms), (4) measures of attention (Alphabet, Number Three and Number Five), (5) tests of mental ability (The Otis Quick Scoring Mental Ability Test).

Each student was also given a standard interview covering high school background, present goals and interests, and general methods of study. After the interview, each student filled out a questionnaire containing personal and scholastic items.

From 79 students for whom complete data were available, two groups of 27 students each were matched on scholastic aptitude. Those students (27) having high German scores constituted the High Achievement Group and 27 having low German scores constituted the low Achievement Group.

Conclusions:

When scholastic aptitude was held constant:

(1) Students having high German achievement scores had the highest scores on the English Training Test.

(2) Students who had high German achievement scores did not have significantly higher scores on any of the other tests.

Concerning the interview and questionnaire items, it was found that the high achievers:

(1) Reported that high school language study helped them in their present study of German.

(2) Were more interested in mastering the German language.

(3) Made daily lesson preparation.

(4) Studied corrections, read for ideas, and studied their vocabulary in context.

II-A-6

CARO, P. W., Jr., "The Effect of Class Attendance and Time Structured
Content on Achievement in General Psychology", J. Educ. Psychol.,
(1952), 53:76-80.

Purpose:

This study was undertaken to compare achievement of students who attended regular lecture-discussion classes with those who did not attend such class sessions, and to investigate student achievement under different amounts of time structure, as determined by the schedule of testing.

Subjects:

Subjects were 335 undergraduates enrolled in general psychology.

Procedure:

Each subject was assigned to one of six subsections of the course. Two extremes of class attendance were used - required attendance at all scheduled class meetings and no classes scheduled. Three degrees of time structure were used - assignment of the entire course content as a single unit, four separate and nonoverlapping assignments corresponding to four major units, and twenty-five nonoverlapping assignments corresponding to the number of scheduled class sessions. An appropriate test was administered at the end of each assignment period covering that assignment only. No information concerning test scores of student progress was given any individual or group. Seven instructors rotated among the groups in such a manner that each instructor had equal exposures to each group.

The criterion of achievement was performance on a 100-item multiple-choice test which was administered as a final examination. Twenty items on the test were covered in the text, but were also heavily stressed in lectures.

Findings:

(1) There was no significant difference in the mean performance of the class and no class groups on the 20 criterion items covering material stressed in class, (2) the F ratios for the class attendance variable, the time structure variable, and the treatment interaction variable were not significant (based on performance of the entire 100 items), (3) the relations between dropouts and treatment groups were not significant.

Conclusions:

(1) This study failed to demonstrate the usefulness of the classroom presentation of materials which were available to students in printed form, (2) it would appear that students can be expected to achieve as well in Introductory Psychology courses by studying the appropriate assignments "on their own" as they can with classroom attendance.

II-A-6

CHANEY, Ruth M., and LAUER, Alvah, R., "Influence of Affective Tone on Learning and Retention", J. Educ. Psychol., (1929), 20:287-290.

Purpose:

The purpose of this study was to experimentally verify the law of effect in a teaching situation.

Procedure:

The intent of the experimentors was to present material of graded degrees of pleasantness or unpleasantness under controlled conditions and to measure the amount of retention after a given number of repetitions; attitude, purposive and attention factors were kept fairly constant. Mean number of words correctly recalled was computed on both a meaningful test and a nonsense list. The nonsense list was used as a control measure.

Results and Conclusions:

1. It would seem that there is no significant difference in learning of such material as used in this study.
2. It was found that 16.3 percent more meaningful material than nonsense material was recalled.
3. The results indicate a common error of logic in attributing the success of learning "under pleasant conditions" or "learning interesting material" to some force called "effect" which is usually considered as an affect of feeling tone.
4. Whether or not the two above described conditions may be synonymous, the law of effect would appear to be merely the attitude of the learner which could be easiest explained as intensity of association during the learning process.

II-A-6

DOUGLAS, L. N., "A Study of Certain Factors Influencing Academic Achievement with Special Reference to the Health Factor", J. Exp. Educ., (1939), 7:235-244.

Purpose:

The problem concerns a study of certain factors thought to condition achievement in English at Baylor University with special reference to the health factor.

Method:

Five measures were used in estimating achievement in English for 109 freshman boys: (1) teachers' marks, (2) departmental test averages, (3) scores on the Purdue Placement Test in English, Form B, administered at the end of the term, (4) the raw gain score as shown by the difference between the scores on Purdue, Form A, administered at the beginning of the term and Form B, administered at the conclusion of the term and (5) the percentage of gain disclosed by Form A and Form B of the Purdue Test.

Other factors considered study habits, IQ, initial English ability, general high school average, average daily study time, socio-economic status, etc.

Health factor--Each S was examined by a physician at the 1st of the term and a weekly health examination was also made.

A six-point rating scale was used from very good to very bad. These classifications were identified by the letters ABCDEF. Areas to be included in each classification were agreed upon by a number of physicians.

Results and Conclusions:

1. When academic achievement in English was considered from the status viewpoint, the factors of IQ, initial ability in English, general high school average, high school English average, and reading comprehension offered the best predictive indices with initial ability in English as the best index.
2. Social and economic factors in achievement were of little predictive value.
3. When an individual's health is studied from the beginning to the end of a school term, his health status during that period is significantly correlated with achievement.
4. If achievement is measured by departmental test averages alone, then the health of the individual at the time of the tests is one of the most important factors conditioning his achievement.
5. Health status (as measured by the comprehensive physical examination) and health function (weekly examinations) are as consistently high in predicting achievement as any of the factors in the study.
6. If IQ, high school average, high school English average, and reading comprehension are considered as a single measure, since they include so many common elements, then the second most important factor in predicting achievement in English is health.

7. If achievement is to be measured in terms of individual improvement, then the percent of gain made in terms of possible gain is a reliable measure. On the other hand, the raw score difference between a pre-test and a final test is not a good measure of improvement because of the inconsistency of the gap occurring in the distribution curves.

8. When the twenty measures employed in the present study are considered in rank order as they affect achievement, the two health measures rank above all with the exception of the conventionally accepted measures of IQ, high school average, and aptitude.

EVANS, R. I., "An Examination of Students' Attitudes Toward TV as a Medium of Instruction on Psychology", J. Applied Psychol., (1956), 40, 1:32-34.

Purpose:

To determine the attitudes of students toward television instruction.

Subjects:

Seventy-four students enrolled in an evening section of elementary psychology were used. No mention of the teaching method of this class was made to the enrolling students. The course consisted of two weekly 45-minute discussion meetings with the instructor on campus.

Procedure:

Before the final examination was given on the last day of class, the students were asked to respond to two questions with either "yes", "no", or "undecided".

(1) Do you feel that you would enroll for another college course that used TV as an instructional medium?

(2) Do you feel that the on-campus discussion sessions with the instructor as an addition to the TV lectures added anything appreciable to your learning in the course?

Space was also provided to answer the question "why" for each question and "general comments" concerning their feelings regarding the course in general.

Findings:

Seventy percent of the subjects were interested in taking another course involving TV instruction, 13% were not and 16% were undecided. The openend responses revealed the feelings that TV lectures:

(1) were better developed than traditional classroom lectures
(2) involved fewer distrubing interruptions from students
(3) lacked opportunities for class participation
(4) were subject to technical electronic interruptions

Supplementary class discussions found 42% of the students in favor, and 56% felt there was no appreciable importance to learning in addition to TV lectures. Two percent of the students were "undecided".

The reaction to the importance of supplementary classes centered around advantages gained through some face-to-face contact with the instructor. Those who favored no need for supplementary classes based their feelings on the idea that TV lectures were sufficiently complete in themselves.

II-A-6

EVANS, R. J., RONEY, H. B., and McADAMS, W. J., "An Evaluation of the Effectiveness of Instruction and Audience Reaction to Programming on ETV Station", J. Applied Psychol., (1955), 4:277-279.

Purpose:

To examine (1) the effectiveness of TV as a medium of formal course instruction and (2) responses of the Houston-wide TV audience to programming on the New Educational Television station (KUHT-TV).

Subjects:

A. To investigate achievement differences in an elementary psychology course three groups were set up: (1) 96 subjects that enrolled in a traditional campus lecture, (2) 17 subjects that enrolled in TV lecture only, and (3) 30 subjects enrolled in a TV lecture plus campus discussion.

B. To investigate achievement differences in an elementary biology course two groups of 78 subjects matched for college class, grades and sex in both TV and non-TV sections were used.

C. Three-hundred-and-eighty-four subjects randomly selected from telephone directory were interviewed to determine the size and reactions of the Houston-wide audience.

Procedure:

A standardized final of 150 items were administered at the end of the study to the elementary psychology students. The classroom lecture group completed their work before the TV lectures in order to secure control. The three groups were not matched. Mid-semester grades were used for the study of the elementary biology class. In both instances the instruction was given by the same professor. A standardized questionnaire was administered by telephone to 384 subjects for the study concerning the size and reactions of the educational television audience; the questionnaire was carefully developed on the basis of two pilot studies and the interviews were conducted by two carefully-trained individuals.

Results:

Mean final exam scores of the elementary psychology courses showed no significant difference among the three groups according to Fischer-t tests. Mean score differences of 50.17 for the elementary biology non-TV section and 45.82 for the elementary bio TV section were not statistically significant. Audience reaction indicated that 75% of the audience watched the station from three times a week to at least once in two weeks. Other findings suggested that: (1) the efficiency of the classroom teacher apparently is not hampered by presenting lectures on TV, (2) a discriminating audience can be expected even a short time after the beginning of the operations of a VHF educational Television station in a large community.

Further studies suggested research directed toward uncovering the effect ETV has on the attitudes of viewers. Another problem might deal with teaching techniques: (1) whether "preferred" TV presentation techniques are related to learning, (2) what types of personality traits are most desirable in a TV instructor.

II-A-6

GILBERT, A. F., "Effectiveness of the SRA Self-Scorer in Teaching Educational Psychology", Masters Thesis, Department of Educational Psychology and Measurements, University of Nebraska, July, 1954.

Purpose:

To determine the effect of the SRA self-scorer upon learning when used in a testing situation as compared with the use of standard answer sheets when the latter method of testing is accompanied by class discussion of the test items.

Method:

In the experimental group, the SRA self-scorer was used instead of the standard answer sheets. There was no discussion with this group. The control group had 50 minutes to complete the test and a 50 minute discussion period after the test (to go over test items). Aptitude of the students in both sections was controlled.

Two criteria were used in the measurement of the outcomes of the experiment. Both criteria consisted of objective type exams administered four weeks later.

Results:

The first criterion was the gain achieved on the second administration of the seventy-four item test. The control group performed significantly better than the experimental group at the 1% level.

The second criterion used was a twenty-five item test built around the hardest concepts in the 75 item test. There was no significant difference between the two groups.

II-A-6

HARBY, S. F., "Evaluation of a Procedure for Using Daylight Projection of Film Loops in Teaching Skills", Pennsylvania State University Instructional Research Program, Port Washington, New York, U. S. Navy Training Devices Center, Office of Naval Research, Human Engineering Report No. SDC-269-7-25, May (1952).

Purpose:

To determine the effects of four variables on the learning of tumbling skills.

Procedure:

A latin square design was used to vary the four variables: (1) film vs. live instructor demonstration, (2) demonstration interspersed with practice vs. massed demonstration, (3) demonstration interspersed with practice vs. continuous demonstration during practice, and (4) degree of coaching during practice. Learning was measured by ratings made by independent judges at the end of the study.

Results:

1. Movie demonstrations were as effective as live demonstrations.
2. The interspersed demonstrations were slightly (but not significantly) superior to the massed demonstrations.
3. Interspersed demonstration was superior (but not significantly) to the continuous demonstration.
4. Coaching was significantly superior to no coaching.

Conclusions:

1. In teaching tumbling, film demonstration is at least as effective as live demonstrations.
2. Coaching during instruction makes a significant contribution to learning athletic skills.

II-A-6

HUSBAND, R. W., "TV vs. Classroom for Learning General Psychology", Amer. Psychol., (1954), 9:181-183.

Purpose:

General findings related to psychology, 204-TV, the first credit course presented over WOI-TV at Iowa State College.

Procedure:

The course material was presented under four conditions:

(1) TV at home - watched and listened to at home, read same text and took final exam at Iowa State campus.
(2) Studio class - in studio while presentation was given.
(3) Kinescope class - campus students who watched films of the TV talks, with 20 minutes of informal discussion afterwards.
(4) Two campus classes - given same materials, but in classrooms, for 50 minutes in usual classroom manner.

Results of grades:

The TV class did better than three of the campus classes, those labeled TV-in-studio and classroom No. 1 and No. 2. The TV-at-home group had no failures and twice as many A's pro rata as the campus students earned that quarter.

The group shown the kinescopes obtained the highest GPA of all groups. The TV-in-studio had the lowest grades probably because of the distraction of the setting.

Recommendations:

(1) Future courses should be of broad population interest, practical or at least related to daily life.
(2) Lecturer:
    (a) A TV speaker should be personal, friendly, jovial.
    (b) He should chat with a single person or small group, not deliver an oration.
    (c) He must be at ease, relaxed, not easily rattled.
    (d) The successful freshman or sophomore teacher is better equipped for TV as he lacks the "abstract scholarliness" of teachers geared to advanced majors or graduate students.
    (e) Must be fluent, without too many hesitations or corrections in speech.

II-A-6

KRATHWOHL, W. C., "Specificity of Over and Underachievement in College Courses", J. Applied Psychol., (1952), 36:103-106.

Purpose:

The purpose of this study was to determine if over and underachievement are general or specific to particular interests. Investigation of the question was carried out by measuring overachievement in one field and correlating the results with measurements in other fields.

Procedure:

Over and underachievement in a field was determined by comparison of aptitude and achievement scores. If the aptitude score was appreciably higher than the achievement score, the subject was considered an underachiever; if the scores were about the same, the subject was normal; and if the reverse happened, he was considered an overachiever. To make such scores comparable, all scores were changed to standard scores.

In this experiment 308 second term sophomores who had taken the sophomore achievement test at the Illinois Institute of Technology were used. The tests were on English expression, chemistry, math, and physics. The aptitude tests were form M of the Chemistry, Mathematics and Physics Aptitude Tests of the Bureau of Educational Research and Service of the University of Iowa. The English Aptitude Test was the short 15-minute section of the Cooperative Reading Comprehension Test, advanced form of the Educational Testing Service. Correlations between aptitude and achievement varied from .42 for math to .58 for English with all coefficients statistically significant.

Derived scores of aptitude minus achievement scores were found for each subject. The subjects in the upper quarter on derived scores were overachievers and the lower quarter of the 308 subjects were underachievers. The derived scores for overachievement in each of the four areas were intercorrelated to determine if they were independent or highly related.

Results:

The correlations of overachievement in English with that in the other three areas were so low that the conclusion cannot be drawn that overachievement in English implies the same in the other subjects. That is to say, a student who overachieves in English may or may not overachieve in the other three areas.

The correlation of overachievement in chemistry with that in physics was not significant either. But a significant though small correlation was found between mathematics and chemistry and between mathematics and physics.

Further analysis by the chi-square method was also performed and all areas except mathematics and chemistry appeared decidedly independent.

Conclusions:

1. As far as engineering students are concerned, and undoubtedly for others, overachievement in any one of the four subjects of English, chemistry, mathematics and physics, does not necessarily imply overachievement in any of the remaining fields. A possible exception is one involving mathematics and chemistry in which there is a possibility that overachievers may be related.

2. An individual should not be considered simply as an overachiever, but as an overachiever in a particular area. Such information is valuable in a counseling situation where it should be remembered that it is possible for an individual to be an overachiever in English, normal in mathematics, and an underachiever in physics all at the same time.

Implications:

If the specificity of over and underachievement can be established as the usual situation, it should be considered in our research as non-intellectual factors. It may indicate, as has been suggested, that not only do non-intellective factors play an important part in achievement, but that different non-intellective factors may be important to achievement in different areas.

II-A-6

LAIRD, D. A., "A Study of the Influence of Sectioning Students Upon Their Achievement", J. Educ. Psychol., (1923), 14:143-153.

Purpose:

To examine the argument of sectioning students into classes. Do students of one section have an advantage over other sections because of the hour at which each group meets?

Setting:

The study reports on findings of the grades received by the elementary students in psychology in a large university throughout a period of 10 years. The 10 years included in the report date back to 1909-1910. For various reasons some years were omitted. Two thousand seven hundred students were divided into two sections which met at 9:00 and 11:00, respectively. The assigning of students into sections was on a first-come basis.

Results:

(1) The 9:00 section made either better or poorer grades than the 11:00 section, while the 11:00 section tended toward averageness in accomplishment.

(2) The differences between the accomplishments of the two sections was greatest when the sections meet at the hours designated, three times a week than when they meet twice a week (with a conference period substituted for a third lecture).

(3) The variations between the sections in marks earned became less as the course was continued (more so for three weekly lectures than for the two).

(4) Students in the 9:00 section showed greater improvement as the course progressed than did the other students.

(5) Intelligence, as tested by a standard test, correlated higher with the accomplishments of the 11:00 group than for the 9:00 group. (This conslusion was explained in that the intelligence class was given during the different class times. Previously, members commented that they forced alertness and attitude of attention for the 11:00 class. The higher intelligence test score in the 11:00 section was due to this forced attention attitude.)

II-A-6     also II-A-1

ROTH, R. M., "The Role of Self-Concept in Achievement", J. Exp. Educ., June (1959), 27:265-281.

Purpose:

To investigate the relationship between self-concept and achievement.

Method:

Theory and propositions - This study dealt with a reading improvement program in which reading films of increasing speed were presented in each successive contact. This required a change on the part of the S and the change required was assumed to be from within. How open a person was to this experience would determine how he perceived this demand. The proposition which was tested in this study was that there would be significant differences among the self-perceptions of three groups in terms of their general defensiveness, self as a self, self in relation to authority, self as a student, and self as a reader conception, such that the three groups will appear in the following order from the most defensive to least defensive: Attrition, Non-improver, and Improver.

The sample - The Ss were drawn from three reading improvement classes at the University of Texas. The only requirements were that the student read initially at the minimum rate of 250 words a minute and have a comprehension of 75 percent on the DRT. These classes met for a total of 14 one-hour sessions. Only freshman Ss were used in the study.

The Ss scores on the Diagnostic Reading Test before and after the program were converted into equivalent scores with use of the graph of equivalent scores which weighed speed and comprehension when considered together.

Improvers were defined as those Ss whose standard scores from pre to post-test increased while non-improvers' scores from pre to post-test decreased. The attrition group contained those Ss who started the program but who discontinued before the 7th session.

Procedure:

The class met four times before the work in reading improvement began.

A. 1st meeting - DRT was given.
B. 2nd meeting - DRT interpreted and SCT given.
C. 3rd meeting - Self sort given.
D. 4th meeting - Ideal sort given.

When the 14 meetings had terminated, four more meetings were scheduled and procedures 1A to 1D were repeated.

Instruments:

(1) The Q sort - The Q sample consisted of 80 self-reference statements on "self I am" and "ideal self". The E chose 80 items sorted as to dimension and orientation. There were two orientations: intensional and extensional; and four dimensions: self as self, self in relation to authority, self as student, and self as reader.

(2) Sentence completion technique was developed from the statements in the Q sort. Responses were analyzed on a 5-point scale from intensional to extensional.

(3) Academic factors - The Ss were compared on a measure of academic aptitude by the ACE and the following achievement measures: The Cooperative English Test GPA's before and after program, and a measure of reading effectiveness.

Results:

(1) Self as a self - The attrition and non-improver groups appeared to be more concerned with this area than improvers. The improvers had the smallest discrepancies between the self and ideal sortings with both the intensional and extensional items. In terms of defensiveness (attempt to maintain a self concept), the three groups appeared to be in the following order (most to least): attrition, non-improver, and improver.

(2) Self in relation to authority - In general, there appeared to be no real difference among the groups in this area. The groups were similar in terms of total self-ideal discrepancies for the dimensions.

(3) Self as a student - The improvers were most concerned with this area. The differences among groups within the extensional orientations were negligible. The attrition was next most concerned with intensional items. In terms of defensiveness (most to least): improvers, attritions, and non-improvers.

(4) Self as a reader - The improvers were most concerned, the non-improvers next, and the attrition group of least concern.

(5) General Defensiveness - The attrition group showed more general defensiveness than either of the two groups with non-improvers next.

(6) Reliability of the sort - The r's of the self sorts before and after the program and of the ideal sorts indicated a consistency well above change.

(7) Academic differences - An analysis of the Ss performance on various aptitude and achievement measures indicated that the non-improvers scored much higher than the other two groups. The improvers and the attrition cases resembled each other in this respect. This relationship held true also with respect to entering reading effectiveness as measured by the equivalent scores. At the end of the program this relationship became reversed as the improvers improved while the non-improvers failed to improve and lost ground. The GPA indicated that although the improvers had significantly lower scores than the non-improvers, they had a high GPA. The attrition group had the lowest achievement record. At the end of the program, the improvers dropped to a grade-point average similar to that of the attrition sample, but the non-improvers and the attrition group increased slightly in terms of GPA.

Summary:

This study attempted to test the proposition that there would be significant differences in the self-perceptions of those who improved, did not improve, and dropped out of a college reading improvement program. The data tended to support the proposition. Other findings such as changes in self-concept and GPA indicated further support for the theory that those who achieve as well as those who do not, do so as a result of the needs of their own self system.

II-A-6

SMITH, D. E., WOOD, R. L., DOWNER, J. W., and RAYZOR, A. L., "Reading Improvement as a Function of Student Personality and Teaching Method", J. Educ. Psychol., (1956), 47:47-59.

Purpose:

This study was designed to investigate the effects of two systematically varied teaching methods on the gain in reading efficiency of two personality syndromes. Specifically, it was designed to test two hypotheses: (1) Type IV individuals, described as permeable or fluid, cycloid and disorganized, will feel most secure in a structured course with a directive structure, and will make optimum gains in such courses, and (2) Type III individuals, described as impermeable or rigid, schizoid, and over-organized, will feel more secure and progress more in an unstructured and non-directive course.

Subjects:

The subjects were 50 college students registered for a reading improvement course. They were classified as Type III or IV on the basis of a personality inventory. They were then assigned to classes according to these classifications.

Procedure:

A balanced design with two treatments, four instructors and sixteen classes were used. External variables consisted of age, sex, year in college, scholastic aptitude, initial reading rate, and reading comprehension as measured by Form A of the Diagnostic Reading Test. All were controlled except reading comprehension in which Type III groups differed in initial comprehension. The criterion of gain was increase in comprehension as measured by an equivalent form of the Diagnostic Reading tests. Each instructor taught four classes, two directive and two not.

Findings:

(1) Type IV individuals increased 9.14% in efficiency under directive treatment, and 46% under non-directive treatment. The difference was significant beyond the .01 level.

(2) Type III individuals increased 56.0% under directive treatment and 94.8% under non-directive treatment. The difference was significant at the .01 level. Analysis of covariance was made to determine if this difference was significant at the .01 level. Analysis of covariance was made to determine if this difference was due to the difference in initial reading comprehension of the Type III directive and non-directive groups. This was found to be the case.

Conclusion:

The method of teaching is a major factor in the learning of individuals who are both anxious and fluid in structure.

II-B-1

RUSSELL, H., MICHAEL, W. B., JONES, R. A., and GADDIS, W. L., "Cognitive and Noncognitive Predictors of Achievement in Student Nursing", Educ. Psychol. Measmt., (1960), 20:387-389.

Purpose:

To determine estimates of the degree of validity of various cognitive measures and of personality measures in the prediction of success of 100 freshman trainees in four parts of the program in student nursing at the Los Angeles County Hospital and to obtain additional evidence concerning the validity of speeded tests of perceptual and spatial abilities.

Methods:

Subjects: From about 400 applicants a class of 114 trainees entered the program during September, 1959. Complete test and criterion data were available for 100 trainees.

Product-moment correlations were found among the 31 variables (ability and achievement tests, subscales of the MMPI, and California Survey of Spatial Relations Ability). Restriction of range upon reading, verbal and math tests was substantial since selection had been determined largely on the basis of placement of applications at least above the 50th percentile for twelfth graders.

Results:

In general, tests in reading and verbal abilities were positively related to the theory course in anatomy and physiology to nursing arts which includes pharmacology, and to the rating of ward performance. Tests in math and reasoning showed some of the highest statistically significant validities attained with respect to the criteria of nursing arts and ward performance. Speeded tests in spatial visualization and perceptual abilities exhibited substantial positive validities with ward performance ratings. The scales of the MMPI for the most part did not yield validities significantly different from zero.

Summary:

Contrary to previously obtained results, only measures of the cognitive type furnished evidence of predictive validity of success in both the didactic and the clinical and laboratory phases of nursing training.

II-C-1

DUNKEL, H. B., "The Effect of Personality on Language Achievement", J. Educ. Psychol., (1947), 38:177-182.

Purpose:

This study was designed to isolate some of the personality factors affecting language achievement.

Procedure:

The Rorschach test was given, by group administration, to 46 students entering the University of Chicago at the eleventh grade. Scores were obtained for subjects on the ACEL and a Latin placement test. Since it was hypothesized that students with a rigid and meticulous make-up would do best in Latin, twelve such students were isolated for comparison. Next 12 students whose Latin score fell 3 standard score points above that predicted by the ACEL were isolated for comparison with 10 students whose Latin scores were 3 standard score points below the ACEL prediction. The Rorashach scores of the two groups were then divided into subgroups according to similar patterns.

Findings:

1. The correlation between the ACEL and the Latin test was .21.
2. Of the 12 in the meticulous group, only one had a Latin score which was significantly higher than that predicted by the ACEL.
3. Three subgroups of overachievers were also isolated. The first subgroup consisted of the one subject who was in the rigid and meticulous group. The second subgroup consisted of well adjusted students who were working up to their capacity. The third subgroup consisted of maladjusted students who seemed to be achieving through sublimation.
4. It was not possible to divide the underachievers into subgroups. In general the subgroups were described as having personality patterns marked by considerable emotionality, inner conflict and anxiety.
5. None of the students with Rorschach patterns indicating good adjustment scored lower on the Latin test than predicted by the ACEL.

Conclusions:

1. Emotional disturbances and inner conflicts may prevent underachievers from functioning with maximum effectiveness.
2. The sublimation of internal forces into school work may be a factor in overachievement.

II-C-1 also II-C-4

GUSTAFSON, M. C., "Relationship Between Manifest Needs and Differential Achievement of High School Students", Ph.D. Dissertation, University of Nebraska, (1956).

Purpose:

The purpose of this study was to determine the relationship between manifest need variables, subject matter, interest and measured achievement.

Subjects:

The subjects for this study were 206 high school senior boys.

Procedure:

All subjects were given a battery of tests which consisted of: (1) the GAT I, Social Studies, (2) the GAT II, Natural Sciences, (3) the Edwards Personal Preference Schedule, (4) the Otis Quick-Scoring Mental Ability Test, the Gamma Form Em, and (5) Interest scales developed by the investigator, measuring interest in the natural sciences and in the social sciences.

Using the test results multiple regression equations were computed for the prediction of achievement in natural sciences and social studies. The prediction variables (intelligence, interests, and the 15 needs measured by the EPPS) were successively eliminated from the regressions and F-tests made to determine the significance of the loss. Final regression equations were then obtained by combining the variables which could not be eliminated without significant loss. Product-moment correlations were also computed between each variable and the criterion.

Findings:

1. The EPPS variable, intraception, was found to contribute significantly (along with intelligence, social studies interest and natural science interest) in the prediction of social studies achievement.
2. The EPPS variable, intraception and succorance, made a significant contribution to the prediction of natural science achievement. The other variables in the equation were intelligence and natural science interest.
3. No other EPPS variables were found to contribute significantly to the prediction of the criterion.
4. Several significant correlations were obtained between the variables and the criterion. They were:

| | | | | |
|---|---|---|---|---|
| achievement | .157* | social studies | .180* | natural science |
| deference | -.160* | social studies | | |
| order | -.297** | social studies | -.235** | natural science |
| affiliation | -.139** | social studies | -.147* | natural science |
| intraception | .179* | social studies | .147* | natural science |
| succorance | | | .159* | natural science |
| dominance | .242** | social studies | .230** | natural science |
| nurturance | -.181* | social studies | -.173* | natural science |
| science interest | .202** | social science | .329** | natural science |
| intelligence | .769** | social science | .799** | natural science |

II-C-1

KENNEDY, W. A., and SMITH, A. H., "A High Performance MMPI Scale for Adolescents", Psychol. Reports, (1962), 11:494.

Purpose:

This study was undertaken in the attempt to meet the need for locating, and to evaluate the possibility of locating, "hidden" high ability and potential for adolescents.

Subjects:

One-hundred-and-thirty NSF-FSU Summer Mathematics Camp students who had completed the camp.

Procedure:

Subjects' records were divided into two groups: Construct Group - sixty-five records were item-analyzed to determine those items which ninety-three percent of the group answered in the same direction. This yielded 140 items which investigators called the high performance scale (HP); Partial-Validation Group - the remaining sixty-five records were scored with the HP scale.

Findings:

"There was no significant difference between the scores of the two groups...."

Conclusions:

This represents only a partial validation - this study is being extended and will probably encompass a three-year period before the investigators state their conclusions.

II-C-1 also II-C-2

MALPAES, Leslie F., "Some Relationships Between Students' Perception of School and Achievement", J. Educ. Psychol., (1953), 44:475-482.

Purpose:

This study was designed to investigate some relationships between students' perceptions of various aspects of the school situation and selected criteria of school achievement.

Subjects:

Ninety-two eighth grade students served as subjects. All subjects had been subjected to the same teachers and general school influences for at least two years. They were considered representative of the socioeconomic stratification of upper New York State.

Procedure:

The subjects were given three measures of perception of school:

(1) a sentence completion test (SCT)

(2) an apperception test (pictures of school situations) (SPT)

(3) a personal documents test (PDT) (autobiography)

Each instrument was subdivided into 5 categories to obtain indices of students' perceptions of their teachers, classmates, achievement, school discipline, and school in general. The achievement criteria were grades and scores on the Stanford Reading and Arithmetic tests. Intelligence was measured by the California Test of Mental Maturity. Product-moment correlations were computed between total and sub-area perceptual test scores and the criteria. The effects of intelligence were then partialed out.

Findings:

The correlations between mean total scores of all three perceptual tests and grades were significant at the .01 level. All correlations between sub-area scores on the SCT and SPT, and one sub-area on the PDT and grades were significant at the .01 level. Correlations between the total and sub-area tests were low and suggested little relationship between the variables. Students' perceptions of school, and of various aspects of school, do not seem to be related to achievement as measured by standardized achievement tests.

Discussion:

This study indicates that there is little relationship between a student's perception of school and his objectively measured knowledge of arithmetic and reading. These findings are in conflict with the results of other studies. This suggests a need for further research in the area.

II-C-4

BARRILLEAUX, L. E., "High School Science Achievement as Related to Interest and IQ", Educ. Psychol. Measmt., (1961), 21:929-936.

Purpose:

To study the relationship of high school science achievement as related to interest and IQ.

Method:

Data were collected in two phases. The data for the first phase were collected among the cumulative records of the graduates of Thibodaux High School, La., during the eleven year period 1949-1959. The sample was 665 or 74.5% of the population. The following information was obtained for phase one: high school over all grade point average, the high school science grade point average, the IQ as revealed by the Otis Quick Scoring Mental Ability Tests, and the results of the Kuder Preference Record. The second phase of the study was designed to yield the following characteristics (a) mental ability distribution containing relatively large frequencies at the higher levels, (b) standard test scores as criteria of achievement, (c) a sample from a different school system making possible certain cross-validations.

The data for the second phase of the study were gathered at the Malcolm Price Laboratory School, State College of Iowa, Cedar Falls, Iowa. From the cumulative records of the graduates during the period 1954 through 1960, the following information on a sample of 137 was obtained: the percentile rank of the composite score of the Iowa tests of Educational Development (ITED), the percentile rank of test 2 of the ITED (General background in natural sciences), the IQ as determined by the California Test of Mental Maturity and by the results of the Kuder Preference Record. The measures were comparable to those obtained on the sample in phase one.

Results:

Phase One: Eighty-three percent of the students within the IQ range 111-130 with a rank or relative science interest within the interval 1-3 were successful. Within the same IQ range, a significantly smaller proportion, 66% were successful when the relative intensity of science interest dropped to the 4-6 interval. There was a high significant positive relationship between relative intensity of science interest and the probability of success in science at IQ's above 85. Within the IQ range 75-90 there was a probability of a grade point average of 2.0 (C). The possible combinations of IQ and relative interest in which there was a 75% probability of success (B average for 4 years) in high school science were: IQ 91-110--Science Interest 1; IQ 111-130--Science Interest 1-5. The combinations of IQ and relative science interest in which 80% were successful were: IQ 96-105--Science Interest 1; IQ 106-117--Science Interest 1-2; IQ 118-130--Science Interest 1-4.

Phase Two results: Phase two reveals that 88% of the students within the IQ range 115-139 and a science interest of 1-3 were successful. Within the same IQ range 58% of them were successful when the relative intensity of science interest dropped to the 4-6 interval. The results were essentially in agreement with the findings in the first phase of the study.

**Conclusion:**

**Under the definition of success in high school science, approximately 85% of students with a relative science interest of 1, 2, and 3 and an IQ above 110 were successful.**

**It is recommended that a science interest measure be employed as a differentiating factor in the identification of the more capable science students and in the establishment of "homogeneous" groups.**

II-C-5

**NORTON**, D. P., "The Relationship of Study Habits and Other Measures to Achievement in Ninth Grade General Science", J. Exper. Educ., (1959), 27:211-217.

Purpose:
To redefine studiousness in terms which would permit application of multiple regression analysis to the question "Does achievement in ninth grade general science relate more closely to study habits than IQ, reading ability and aptitudes?"

Method:
Sample: 41 boys and 51 girls who had received training from the same instructors in seventh and eighth grade general science and whose previous testing program had been identical. The study had six independent variables and one dependent. The independent variables were: (1) Iowa Silent Reading, (2) Iowa Algebra Aptitude, (3) Otis Quick Scoring, (4) Student Rating, (5) Instructor Rating, (6) Differential Aptitudes (Verbal Reasoning, Abstract Reasoning, Space Relations and Mechanical Reasoning).

Student Rating - Each student in the sample sections was rated by five other students assigned to the same section in accordance with a rating scale and instructions by the instructor. Each student rated and was rated 5 times. Instructor ratings differed from student ratings in that they were meant to evaluate not what might be called impression but an accumulation of evidence and impression. Analysis proceeded separately for boys and girls.

Results and Conclusions:
This investigation did not find study habits, as measured by Instructor Rating, more closely associated with achievement in ninth grade general science than intelligence, reading ability, and aptitude. When measured by student rating, it was more closely associated for boys.

As rated by other students, the study habits of boys were statistically significant predictors of science achievement; as rated by the instructor, their study habits neared significance negatively.

The difference between Instructor Rating and Student Rating of study habits of boys was significant beyond the 1% level; the difference was not significant for girls.

Aptitudes, as measured by the Differential Aptitude tests, were the most significant predictor for both sexes considered together.

Instructor Rating appeared less valuable for predictive purposes than any other independent variable.

II-C-6

OLANDER, H. T., and BROWN, Betty, "A Research in Mental Arithmetic Involving Subtraction", J. Educ. Res., 53, 3:97-102.

Purpose:

1. To what extent does proficiency in mental arithmetic depend upon whether the exercises are presented orally to pupils or by means of flash cards? How does such proficiency compare with that possible when pupils receive the exercises in written form and can use paper and pencils in their calculations?

2. To what degree is proficiency in mental arithmetic, when the exercises are presented orally, dependent upon the factors of school grade, sex, general intelligence, general arithmetic achievement, and memory span?

3. How do thought processes and methods of solution involving mental arithmetic differ among high and low achieving pupils?

4. How do such thought processes and methods vary with school, grade, sex, intelligence, general arithmetic achievement, and memory span level of pupils?

Procedure:

Three forms of a 26-item subtraction test were used in oral form, flash card form and a written form.

The subjects (high and low achievers) were interviewed and asked to orally work no less than 12 examples and to work four to six examples using paper and pencil. These interviews were recorded both on special sheets and on tapes of which the subjects were not aware. A specially constructed memory span test was given, and although intelligence tests had been given to all subjects, Stanford Achievement scores were available only for those subjects in grades 6 through 9.

Results and Conclusions:

1. Mental arithmetic "is facilitated by means of flash card presentation as over against oral presentation."
2. "After the eighth grade there was only a small gain in ability to solve subtraction samples without paper and pencil."
3. Boys performed mental arithmetic better than girls, but were about equal when using paper and pencil.
4. Mental arithmetic is apparently more dependent upon ability in general arithmetic than upon intelligence.
5. Mental arithmetic does not seem to be dependent upon memory span to a great degree.

II-D-1

BASSHAM, H. C., "Relationship of Certain Overt Symptoms of Emotional Tension to Achievement in Reading and Arithmetic in the Third Grade", M.A. Thesis, University of Nebraska, (1953).

Purpose:
To evaluate the relationship of overt symptoms of emotional tension to achievement in arithmetic and reading while intelligence and personality factors are held constant.

Procedure:
One hundred and five third grade pupils were rated by their teachers over a period of five days on a checklist of 18 overt symptoms of emotional tension. The pupils were also rated on a similar checklist by a trained observer for a two-hour period during the same week. The overt symptoms observed were temper tantrums, overagressiveness, timidity, withdrawing, attention seeking, hair twisting, flushing, paling, trembiling, scratching, nose picking, sucking objects, chewing objects, hyperactivity, speech difficulty and nail biting. In addition, each pupil was examined by the school nurse for bitten fingernails. Scores on the California Test of Personality and Social Adjustment, Primary Battery, Form A, and the Henmon-Nelson Test of Mental Ability were used to control these two variables. Scores from achievement tests in arithmetic and reading were used as criteria.

Results:
Multiple regression analysis indicated that scores by the trained observer contributed significantly to the multiple correlation with arithmetic. Social adjustment scores correlated significantly with reading and IQ content.

Three groups representing those observed to bite fingernails, those who sucked their thumb and those observed to pick their noses, together with a control group for each were obtained. Twelve t-tests representing comparison of scores in arithmetic achievement, reading achievement, self-adjustment and social adjustment, for each of the three pairs were computed. Significant differences were found between mean scores in self-adjustment for the nail biting groups and control.

Conclusions:
Frequency of overt symptoms displays as recorded by a trained observer were significantly related to achievement scores in arithmetic. Social adjustment scores were significantly related to reading achievement scores although the contribution to multiple correlation with arithmetic was negligible.

II-D-6

BASSHAM, H. C., "Relationship of Pupil Gain in Arithmetic Achievement to Certain Teacher Characteristics", Ph.D. Dissertation, University of Nebraska, (1960).

Purpose:

This study was designed to investigate the relationship between changes in arithmetic achievement of sixth grade pupils and test scores of several characteristics of their teachers. Teacher characteristics investigated were (1) understanding of basic mathematical concepts, (2) attitudes toward methods of teaching arithmetic, (3) ability to interpret the results of a standardized test currently being used by teachers.

Subjects:

The subjects for this study were 28 sixth grade teachers and 620 of their pupils, from a single urban school district. The backgrounds of the teachers varied in teaching experience and mathematical background. The sample of teachers and students was considered to be representative of the school system.

Procedure:

The teachers were administered a battery of tests, developed by the investigator, near the end of the experimental period. The battery consisted of (1) a test of basic mathematical understanding, (2) an inventory of attitudes toward methods of teaching arithmetic, and (3) a test measuring ability to interpret standardized test scores.

The students in each class were classified as having IQ's above or below the class mean. Before and after the experimental period they were given a battery of tests which consisted of (1) California achievement tests for reading and arithmetic, (2) Henmon-Nelson Test of Mental Ability, and (3) an arithmetic interest inventory.

Teacher scores on the test battery were compared with scores of their pupils in post-experimental arithmetic after controlling statistically for those pupil differences found to exist at the beginning of the experimental period. These relationships were computed for pupils' classes as having above average IQ's, for those having below average IQ's and for the group combined. The relationships between change in arithmetic interest and arithmetic achievement were also computed.

Findings:

1. A correlation significant at the 1% level was found to exist between teacher understanding of mathematical concepts and weighted pupil gain in arithmetic for students with IQ's above the class mean. No significant difference was found for the low IQ group. The difference in weighted gain between the classifications of pupils was significantly related to teacher understanding of math concepts.

2. Change in pupil interest was correlated at the 1% level of confidence with gain in arithmetic for pupils in the lower IQ group. The relationship did not exist for the upper group.

3. Teacher scores of attitudes toward methods of teaching arithmetic was not correlated significantly with pupil gain for either group.

4. Teacher scores on interpretation of standardized tests was not correlated with student achievement for either group.

Conclusions:

For as far as can be generalized from the sample, teacher understanding of mathematical concepts is significantly related to student achievement in arithmetic, however this relationship holds only for those with above average ability. No significant relationship exists between student achievement and teacher scores on attitudes toward teaching methods and teacher scores on test interpretation. Gain in achievement tends to increase more markedly in relation to change in interest among pupils with less than average ability.

Discussion:

Several implications of the study were discussed. They were:

1. Greater emphasis should be placed on the basic mathematical concepts in the training of elementary school teachers.

2. The differences found in the performance of the two groups suggests the need to provide for such differences, and points out a need for further research in the area.

3. Reactions of teachers to certain items on the inventory of attitudes toward methods of teaching arithmetic, suggest that such instruments may be valuable sources of information.

II-E-1

ROSENBERG, L. A., and McHENRY, T. B., "The Prediction of Academic Achievement with the California Psychological Inventory", J. Applied Psychol., (1962), 46:385-388.

Purpose:
The purpose of the study was an attempt to use the California Psychological Inventory to predict academic success or failure of enlisted personnel in three courses of advance military school.

The three courses are Neuropsychiatric Procedures (NP), a four-week course to train enlisted personnel to assist in care of patients with neuropsychiatric disorders; Clinical Psychology (CP), an eight-week course in administering and scoring the WAIS, MMPI and others; and Social Work Procedures (SW), an eight-week course in abstracting medical records, obtaining social histories from patients, and carrying out treatment plans.

In all three courses, stress was placed on understanding the basic concepts of normal personality development. Additional instruction in the symptoms and classification of psychiatric illness along with case conferences were also given.

To keep student attention to a minimum, yet maintain high standards of proficiency, an attempt was made to utilize personality measures as a screening device. An earlier study indicated the MMPI would not serve this purpose (Hewitt and Rosenberg, 1962). The present study investigated the predictive value of the California Psychological Inventory for the same purpose.

Procedure:
Two samples of subjects were used. The first sample of 162 students was made up of all students in two CP classes, three SW classes, and two HP classes. The cross validation sample consisted of 68 students from three other classes, one each of CP, SW and NP.

The two samples were matched closely in age, GT scores and the amount of education as can be seen in Table I. GT score was an optimal measure which was an average of scores obtained on the Reading and Vocabulary and Arithmetic Reasoning subtests of the Army Classification Battery. This GT score has been found to correlate highly with the WAIS.

At the start of each course, the CPI was given to each class as a group but wasn't scored until after graduation when final grades were available. Grades, the criteria of academic success, were the average of the subjects' grades on several objective tests.

Results:
In correlating GT and the CPI scales with grades for the first sample, SW and CP classes were combined into one group because of the similarity of content, duration and average grade for the period. NP students were left in a separate group. The significant Pearson Product-Moment correlations of CPI scales and GT with grades in the SW, CP classes, Sample I, were as follows: **sig. at 1% level, *sig. at 5% level.

TABLE I

| Scale | Class<br>CP + SW(N=98) | NP(N=64) |
|---|---|---|
| General Technical | .577** | .549** |
| Dominance | .200* | .307* |
| Capacity for Status | .376** | .439** |
| Social Presence | .321** | |
| Self Acceptance | .347** | |
| Self Well Being | .236* | |
| Responsibility | .248* | |
| Tolerance | .424** | .234* |
| Communeity | .216* | |
| Achievement via Independence | .459** | .472** |
| Intellectual Efficiency | .368** | .310* |
| Psychological Mindedness | .210* | .343** |
| Flexibility | .381** | |

In an attempt to refine predictive accuracy, multiple predictive equations used the CPI scales and the GT scale as independent variables and academic grades as the dependent variable. Results of the Wherry-Doolittle variable selection procedure indicated the following combinations of variables and the maximal correlation with the criterion: NP class-GT + Ai and GT + Ai + Sa; CP + SW classes-GT + Ai and GT + Ai + Cm. The resultant multiple prediction equations were:

NP: $Xo = .293 + .319\,(GT) + .589\,(Ai)$

$Xo = .176 + .319\,(GT) + .658\,(Ai) + .497\,(Sa)$

CP + SW: $Xo = .293 + .306\,(GT) + .387\,(Ai)$

$Xo = .172 + .284\,(GT) + .439\,(Ai) + .845\,(Cm)$

(The formulas are in raw score form and Xo equals predicted criterion score.)

Only two and three variable equations were considered since addition of a fourth variable produced a negligible increase in the multiple R in the original sample.

The next step was to cross-validate these equations with Sample II. The predicted criterion scores were obtained for each S by solving the equations. Correlations were then obtained between predicted and obtained scores. The results were as follows:

| | Multiple R's of Sample I | | Cross-Validation R's of Sample II | |
|---|---|---|---|---|
| Prediction Equation | CP + SW<br>N=98 | NP<br>N=64 | CP + SW<br>N=35 | NP<br>N=33 |
| GT + Ai | .610** | .600** | .631** | .588** |
| GT + Ai + Cm | .639** | | .566** | |
| GT + Ai + SA | | .641** | | .588** |

II-E-3

HADLEY, J. M., "The Relation of Personal Data to Achievement in a Radio Training School", Psychol. Bull., (1944), 41:60-63.

Purpose:

To investigate the relationship between achievement and other individual differences not directly measurable by tests. The data were derived from the personal data sheets of 275 sailors and 345 marines.

Method and Results:

Following are the percentages of the men possessing previous radio experience, college training and those over 25 years of age:

| | Prev. Radio Exper. | College Training | Age Over 25 |
|---|---|---|---|
| Sailors | 64% | 41% | 47% |
| Marines | 7% | 84% | 28% |

In terms of results, the sailors exceeded the marines in achievement and in technical knowledge of electricity. Furthermore, the reports of the instructors indicated that the sailors were more cooperative and better students. To ascertain whether the difference was due to knowledge or motivation, sailors and marines were equated on electrical knowledge. From an analysis of the results, it was concluded that if the marines were carefully selected as regards their knowledge of electricity, their achievement would compare favorably with sailors.

It was concluded that there would be fewer instances of failure if selection for this type of training was made upon the basis of tests of mathematical and electrical knowledge. Other factors would seem to be of secondary importance although experience, college training, and especially the desire to study radio were definitely advantageous.

## Criterion Group Two Summary

Whereas the criteria involved in Criterion Group One researches might be described as aggregate measures of several course outcomes, the criteria involved in Criterion Group Two usually concern outcomes from a single course. Thus, any particular criterion in a Group Two study can be considered as more homogeneous than such a criterion from a study in Group One.

Single course mark criteria - When a single course outcome is used as a criterion of learning, there is a tendency for general measures of student characteristics to correlate higher with the cirterion than when an aggregate criterion is utilized. This may be explained in terms of the relative homogeneity of the single course criterion. In other words, there is likely to be less masking of whatever relationships exist through keeping individual course outcomes separate rather than combining them.

To an even greater degree than in the previous group of studies, the greater the specificity of the prediction variable for the criterion, the higher the relationship reported. Of the various nonintellective factors investigated, attitudes and mental set appear to offer greatest potential for future research.

Lack of repeated measurement - Throughout the studies in Criterion Groups One and Two, nearly all measures of the nonintellective factors were obtained only once--either just before or at one point during the learning experience. Little or no effort has been devoted to measuring change in the nonintellective factor concerned. Likewise, few attempts have been made to modify the nonintellective factor to increase its relationship to the criterion. There is a need to design future studies which will permit the investigation of both change in nonintellective factors as well as their manipulation when learning outcomes from a single course are used as the criterion of learning.

Interaction of nonintellective factors - Findings from several studies in this and the previous section point to a differential functioning of nonintellective factors within categories of other variables. Of all the interactions studied, those with sex and intelligence are most pronounced. This suggests that in future research, evidence must be obtained to demonstrate that such interaction is not influencing the results of each experiment.

Variety of nonintellective factors - In reviewing the literature on the relation of nonintellective factors to learning, the general imaginativeness and creativity of investigators is readily apparent. The taxonomy used for classifying the studies reviewed here does not do justice to the variety of the factors investigated. It may be noted, however, that with the possible exception of biographical inventories and study skills measures, there is an almost complete absence of system with which the investigations have been undertaken. A complete and detailed taxonomy of nonintellective variables and findings would be helpful in planning additional research in this area.

Teacher mark contamination - In some studies in Group Two, objective measures of course outcomes were used as criteria. On the other hand, teacher assigned course marks were used as criteria in other studies. When course marks are used as criteria, it is quite possible that a spuriously high relationship may be reported as the result of the teacher's observation of the nonintellective variable and the subsequent influence of this observation on grading. To gain a better understanding of this circumstance, it would be desirable to design a series of studies in which dual assessments were recorded by the teacher; one assessment for non-intellective factors and another assessment of course outcomes. This would permit more sensitive isolation of the elements of the heterogeneous teacher mark criterion than has previously been available. Subjective teacher judgments of pupil growth, however, offer little potential as criteria for future media research.

## III. Criterion Group Three: Performance in Experimental Learning Situations

Criterion Group Three is comprised of researches in which the criterion involves performance during an experimental condition of some type. Most of the conditions investigated were defined and manipulated by the investigator, as in laboratory studies. In some researches, however, field conditions such as preregistration test administrations were designated as the criterion after the tests had been administered. Behavior sampled by the criterion measures in Criterion Group Three varies widely as is revealed by the following illustrative titles:

"Effects of Stress and Anxiety on Performance of a Complex Verbal-Coding Task"

"Manifest Anxiety and Performance on Problem Solving Tasks"

"The Influence of Attitude Upon Transfer"

"Effect of Familiar Background Music on Film Learning"

"Communicated Anxiety in a Two-Person Situation"

"Effects of Situational Anxiety at Different Stages of Practice"

"Personal Preference for Method as a Factor in Learning"

III-A-1

ALTUS, W. D., "Personality Correlates of Q-L Variability on the ACE", J. Consult. Psychol., (1952), 16:284-291.

Purpose:

To study the relationship between personality factors and variation in ability along the quantitative-verbalist continuum for college women.

Subjects:

Two-hundred freshmen women at Santa Barbara College, California.

Procedure:

The raw Q + L scores on the ACE were converted to standard scores with a mean of 50, and a sigma of 10. The total group was broken up into quarters of 50 each. Q4 was represented by those women with the greatest excess of Q over L and Q3, Q2, and Q1 represented the continuum down to little Q score in relation to their L. The "yes" responses to each item composing the group form of the MMPI were tabulated for these four equal groups. An item was retained only if the "yes" answers of the intermediate groups, Q3 and Q2, deviated in the same direction as they did for Q4-Q1 groups. This precaution seemed necessary because the probably low reliability of individual T-F items in the MMPI would otherwise affect the inclusion of a number of items of no validity. Forty-three items met this rule of thumb type deviation for the respective quarters Q4-Q1 and Q3-Q2.

Results:

The Q higher than L college women were characterized by conventional, inhibited, sexual and religious attitudes. They had a definite displeasure in reading. They had an anxious dysphoric cast. They were characterized by certain resentful attitudes which were at variance with more numerous Pollyanna tendencies. They also had a more dependent attitude on the opinions of others. The 43 MMPI items yielded a sigma of .63 with Q-L differentials on the ACE for the 200 women. The manner of obtaining the items evidently made this high for a validation group of 100 women at the same college; the r was .25. Compared with the Q, the L woman was freer, less hidebound, more adventurous, less anxious, more literate and more mature.

Summary:

A possible explanation for the immaturity of the Q higher than L college woman was a lack of diverse reading which could call into question certain prim, conventional attitudes.

Discussion:

There was quite a bit of room for change factors to have slipped by the statistical mesh. Also the population had a narrow-range of talent. However, the findings were expressed in terms of quantity. This study indicated that "attitudinal frames" are related to certain types of abilities.

III-A-1

ATKINSON, J. W., and REITMAN, W. R., "Performance as a Function of Motive Strength and Expectancy of Goal Attainment", J. Abnorm. Soc. Psychol., (1956), 53:361-366.

Purpose:

The purpose of this investigation was to study the effects of achievement motivation on performance under two conditions: (1) a condition where strong motivation to achieve is active, and (2) a condition where there is strong achievement motivation and also strong affiliation motivation, both of which lead to the same goal.

Subjects:

Ninety-three Introductory Psychology students served as subjects.

Procedure:

Several weeks before the experiment, each subject's need for achievement was measured by 4 TAT-like pictures designed to elicit responses reflecting need for achievement. They were then divided at the median to provide high and low achievement need groups. Forty-nine subjects were assigned to condition 1. High achievement motivation was aroused by E by emphasizing the importance of doing well on the tasks and by alluding to them as being similar to tests of important abilities measured by other psychological tests. They were then assigned individually to small test rooms and left to work alone without the competitive cues provided by the sight and sound of others working. Fourteen minutes were given for each task.

Forty-four subjects were assigned to condition 2. They were given the same instructions as those in condition 1 except that they were told that the person with the highest score would win $5.00. The subjects worked in the same room in groups of 10 to 20. The E's circulated around the room with stop watches in hand as if evaluating the seriousness of each subject's effort. Fourteen minutes was allowed for each task. The first task consisted of a booklet containing rows of 1/2 inch circles in which the subject was instructed to draw X's. The second task was 24 arithmetic problems.

Results:

1. The mean number of X's drawn was significantly (.01 level) greater under condition 1. There was no difference between high and low need for achievement groups under either condition.

2. Under condition 1, the high need for achievement group attempted and solved significantly (.01 level) more arithmetic problems than the low need for achievement group. There was no significant difference in the performance of the two groups under condition 2.

3. A further analysis was carried out for 58 subjects for whom ACE Q scores were available. The mean Q score for the high achievement group was 64.6 and 57.2 for the low achievement motivation group. The difference was not significant. This high need for achievement group attempted significantly (.05 level) more problems (71.2 vs. 61.7). The effect of motivation on performance was more pronounced for the low ability group.

4. No systematic relationship was found between need for affiliation and performance.

Conclusion:

The relationship between performance is reduced when other motives (such as affiliation) are active in the same performance.

III-A-1

BASS, B. M., "Effects of Motivation on Consistency of Performance in Groups", Educ. Psychol. Measmt., (1959), 19:247-252.

Purpose:

To study the effects of motivation on consistency of performance in groups.

Method:

In the present study, 51 groups of 5 ROTC sophomore cadets varying in motivation to enter advanced ROTC were administered a "screening examination". Twenty-seven groups were of high motivation, 12 were of medium motivation and 12 were of low motivation according to self ratings of the subjects on how important it was for them to enter advanced ROTC. These ratings had been validated in four ways. A single problem was as follows: Each member of a group privately ranked a set of 5 words according to his estimate of the familiarity of the words to enlisted men. A group decision was reached and the subjects again privately ranked the words. A correct order was then announced. Mark-sense data processing was used to obtain various measures of accuracy, stability, and agreement among the subjects who registered their rankings on specially prepared IBM cards. These yielded answers based on the rank difference correlations within and between subjects.

Results:

Split-halves reliability of the various objective measurements for samples of subjects at each motivational level was compared with 95 low motivational subjects in a previous study. A general trend emerged. Subjects of lower motivation tended to exhibit more consistent social behavior than those of higher motivation.

Leadership measures followed the general trend of increasing consistency with decreasing motivation. On all eleven measures considered, reliability was never highest when motivation was highest.

Summary:

Reliability was never highest for any of the eleven related objective measurements when motivation was highest. The results may be accounted for by the effects of stress on the variability of behavior.

III-A-1

BEVAN, W., and MAIER, R. A., "Emotional Tension and the Generality of its Effect Upon Intellectual Performance", J. Pers., (1958), 26:330-336.

Purpose:

To study the emotional tension and the generality of its effect upon intellectual performance using three variables--level of initial tension, similarity in the nature of the test tasks, and the E's behavior toward the Ss during the initial test session.

Method:

One-hundred-fifty college Ss, in 15 matched groups of 10, spent ten minutes working number series problems. Then, after a 4-minute rest, five groups worked on an equivalent set of number-series problems, five on a verbal analogies test, and five on a same-opposites test. It was assumed that the second set of tasks represented several degrees of similarity to the first. Three of the groups on the initial test were simply asked to solve some problems, while six were told that they were taking an IQ test and then harassed during its administration. It was assumed that the different behaviors of E would induce different levels of tension in the several groups. Three of the six intermediate and three of the six high tension groups were formally instructed to relax during test two to provide a further check on the influence of sets induced by the instructor's behavior during the first test upon the spread of tension effects to performance on the second test.

Results:

(1) Performance on the initial test: the effect of tension level. There was a negative relationship between tension level and accuracy, and a slight positive relationship between tension and speed. Only the relationship between tension and accuracy was reliable.

(2) Performance on the second test: effect of formal attempts to reduce tension. Neither the behavior of E on test two nor the interactions of this variable with level of tension on the initial task and task similarity approached significance.

(3) Performance on the second test: effect of initial tension level. Difference in tension induced during the first test had no effect on test two performance.

(4) Performance on the second test: effect of task similarity. There was no suggestion of a general relationship between performance on test two and degree of similarity between tests one and two.

Summary:

Tension level was found to affect accuracy adversely but not speed of performance during the first test. No differences in performance among 15 groups were found in test two.

III-A-1

BURNS, Z. H., "The Effects of Motivation on Changes in Variability During Practice", J. Educ. Psychol., (1938), 29:202-214.

Purpose:

The purpose was to determine the effect of motivation on the variability of a group during practice, and if motivation has an effect on practice, who was affected the most in the group.

Procedure:

Two groups were selected that were as nearly identical as possible. Each group participated in practice sessions of code writing and addition once a day, five times per week. Both groups were conducted identically, but the motivation group was able to see their scores and comparisons both between and within the groups. Scores were computed on amount completed, and total group scores were then compared.

Results:

In both code writing and addition, the motivated group was initially lower in performance, but eventually surpassed the control group and continued to get higher scores.

Conclusions:

The effect of additional motivation upon changes in variability is not constant, but varies with the function. In this study, added motivation stimulated most strongly those who were initially high in the function.

CALVIN, A. D., KOONS, P. B., Jr., BINGHAM, J. L., and FINK, H. H., "A Further Investigation of the Relationship Between Manifest Anxiety and Intelligence", J. Consult. Psychol., (1955), 19:280-282.

Purpose:

To investigate the contradictory findings reported by investigators concerning the obtained correlation between A scale (from Taylor Manifest Anxiety Test) and intelligence.

Procedure:

Group A consisted of 36 subjects (21 male and 15 female) who were members of an undergraduate psychology course at Michigan State University. Group B consisted of 15 subjects (12 male and 3 female). Group B was made up of students having scholastic difficulties. Each subject was administered, individually, the Wechsler-Bellevue Intelligence Test and the A scale from the Taylor Manifest Anxiety Scale which was as Taylor suggests, given with the Biographical Inventory Items.

Results:

Wechsler-Bellevue scores were as follows: Group A had a mean of 123 and SD 9.18; Group B had a mean of 108 and SD 10.41. Group A and B: Correlation between total IQ and A scale was -.31; significant at 5% level. Subtest correlations with A scale which were significant at the 1% level were: Verbal IQ, Information, and Block Design (all negative correlations).

Conclusions:

"These fingings indicate the necessity of restricting the conclusions drawn from a particular experiment to the population under study and the specific measure of intelligence used."

III-A-1

CARRIER, N. A., "The Relationship of Certain Personality Variables to Examination Performance Under Stress", J. Educ. Psychol., (1957), 48:510-520.

Purpose:

To study the relationship of certain personality variables to examination performance under stress.

Procedure:

Two hundred fifty Introductory Psychology students were divided into two groups and given an examination. One group took the examination under high stress conditions and the other under low stress conditions. Their examination scores were then compared with their scores on the SA-S Personality Inventory and the Need for Affiliation and Need for Achievement Test. The number of students in each group who "clutched" was also recorded.

Findings:

1. There was significantly more "clutching" reported by the high stress group.
2. High SA males and females were significantly affected by the stress.
3. There was significant difference for low S males and females.
4. Females low in both need for achievement and need for affiliation were hindered by the high stress condition.
5. Females high in both S and SA were hindered by the high stress conditon.

Conclusions:

1. Personality characteristics of the student and the stressfulness of the situation may be considered a determinate of test behavior.
2. There may be a sex difference in response to stress.

III-A-1

CRAFTS, L. W., and GILBERT, R. W., "The Effect of Knowledge of Results on Maze Learning and Retention", J. Educ. Psychol., (1935) 26:177-187.

Purpose:

This study was conducted to determine the effects of knowledge of results, and incentive to surpass another group in the special case of maze learning by college students.

Procedure:

Two comparable groups were selected for learning a maze. The control group was given no special information. The experimental group was given a typewritten sheet giving average scores made by other students, and instructed to try to do better. They were given their results after each trial. One week later, the maze was relearned by both groups.

Results:

In the learning phase the control group was slightly superior in trials and time, and the experimental group in errors. In the relearning phase the experimental group was slightly superior. None of the differences, however, was significant.

III-A-1

DAVIDS, A., and ERIKSEN, C. W., "The Relation of Manifest Anxiety to Association Productivity and Intellectual Attainment", J. Consult. Psychol., (1955), 19:219-222.

Purpose:
The two purposes of this study are (1) to test the deduction, based on Hull's theoretical system, that a high drive level would lead to a greater number of responses being supra-threshold, and from this the investigators expected to find manifest anxiety scores to be directly related to the number of word associations given on a chained word association test; (2) to investigate anxiety scale and intellectual ability (3) to measure relationships.

Setting:
Forty male undergraduates were selected from a group who had volunteered for "an extensive series of psychological studies." The basis of selection was being as diversified as possible in regard to socioeconomic status, interests and extracurricular activities.

Criterion: (1) A list of 100 nouns with 10 words selected as related to anxiety and the other 90 related to a variety of attitudes, beliefs and personality traits. (2) Measures of intellectual ability were grade-point averages (converted from letter to numerical grades with A = 1 and E = 12, accounting for pluses and minuses), and performance on the college entrance examinations.

Procedure:
The word association test was administered by a tape recording on which 20 seconds were allowed between each word presentation during which the subjects recorded his chained associations on the supplied, numbered data sheets. After the association test, the anxiety scores were obtained--"the items selected by Taylor were interspersed among the items from the hysteria, psychasthenia, lie and K scales of the MMPI."

The measures of intellectual ability were obtained from transcript of the subjects' academic records.

Findings:
Correlations between anxiety scores and several measures of word association performance are reproduced in the following table:

"PRODUCT-MOMENT CORRELATIONS BETWEEN MANIFEST ANXIETY AND WORD ASSOCIATION TEST PERFORMANCE"

| Measure | Number of Associations | Number of Anxiety Responses | Percentage of Anxiety Responses |
|---|---|---|---|
| 100 stimulus words | .45** | .54** | .34* |
| 90 non-anxiety stimulus words | .40** | .42** | .35* |

* Significant beyond .05 level
** Significant beyond .01 level

With and without including the 10 anxiety stimulus words, the productivity of associations was positively related to anxiety score. When subjects were equally divided into highest and lowest anxiety groups, the mean numbers of associations given were 530 and 454 respectively. The difference between these means yielded values significant at the .001 level.

The second column of the preceeding table represents the degree of correlation between anxiety scores and the number of anxiety responses given and these correlations indicated that high anxiety scoring subjects tended to produce more anxiety associations than low scorers. Even when corrected for differences in total productivity, this held true as indicated in the third column of the above table.

Anxiety scores correlated .02 with the entrance examination scores and .17 with the grade-point averages. Neither was statistically significant. Also, no significant relationships were found between word association productivity and either of the intellectual ability measures.

Conclusions:

Subjects who obtained high manifest anxiety scores tended to produce more anxiety associations than did subjects who obtained low manifest anxiety scores.

These findings indicated that anxiety scores were independent of intelligence. Although these findings were based on an intellectually homogeneous population, "most of the findings reported with the anxiety scale have been obtained with college students similar to those employed in the present study." Thus, the authors indicated "it would seem safe to conclude that the demonstrated differences in performance between subjects who score high and low on this scale of manifest anxiety are probably not attributable to differences in intellectual ability."

III-A-1

DURGANAND, Sinka, and TRIPAT, Raj Singh, "Manifest Anxiety and Performance on Problem Solving Tasks", J. Consult. Psychol., (1959), 23:469.

Purpose:

The relationship of manifest anxiety and performance on problem solving tasks.

Method:

In this study the performance of 20 high scoring and 20 low scoring subjects on the Taylor Scale of Manifest Anxiety was compared on a set of six problem solving tasks which were novel and of moderate difficulty. Three of the tasks were sensori-motor in character and the other three involved largely mental activities. Within the framework of Hull's theory, it was expected that tasks being complex involving a hierarchy of competing responses, the higher drive level, as measured by high scores on the Taylor Scale would lead to impairment of performance.

Results:

Though HA subjects had committed a few more errors on each task, the performance of the two groups did not differ significantly in respect to errors. The HA group consistently required more time for solving both the sensori-motor and mental tasks, t-ratios being significant in all cases except one.

Summary:

Relatively longer time required by HA subjects in solving problems has obvious implications for speed tests. Anxiety level seems to become a significant variable in test performance. It is particularly so on speed tests.

Discussion:

The inferiority of HA subjects can be explained in terms of difficulty of integration of responses and the selection of the correct one out of many possible responses. Increased drive level multiplied indiscriminately the strength of all competing responses. This study indirectly seems profitable for the study.

III-A-1

EDMISTON, R. W., and JACKSON, L. A., "The Relationship of Persistence to Achievement", J. Educ. Psychol., (1949), 40:47-51.

Purpose:

This study was designed to investigate the relationship between persistence and achievement.

Subjects:

One hundred college students served as subjects.

Procedure:

All subjects were administered nine measures of persistence, achievement and capacity. Persistence measures were (1) mechanical persistence as measured by a difficult jigsaw puzzle; (2) crossword puzzles used to measure linguistic persistence; and (3) quantitative persistence as measured by a number puzzle. Capacity was measured by Edmiston's Quantitative and Linguistic tests and parts of the Detroit Mechanical Aptitudes Examination. Achievement was measured by the reading and arithmetic parts of the Progressive Achievements Tests and part of the Detroit Mechanical Aptitudes Examination. Product-moment correlations were computed between 16 combinations of the test scores.

Findings:

Correlations between persistence and achievement were in general very low. The correlation coefficients between persistence and mechanical achievement was negative while those for linguistic and quantitative achievement were positive. The only significant correlation between persistence and achievement was for linguistic achievement which correlated with linguistic persistence .28.

Conclusion:

The results lead to two possible conclusions: (1) There was very little relationship between persistence and achievement, or (2) the measures used to measure persistence were not valid.

III-A-1

KAGAN, J., and MUSSEN, P. H., "Dependency Themes on the TAT and Group Conformity", J. Consult. Psychol., (1956), 20:29-32.

Purpose:

To see if a positive association exists between TAT dependency themes and the tendency to adapt objectively inaccurate group judgments in a situation where there is strong social pressure favoring conformity.

Procedure:

Twenty-seven male college students wrote stories in response to eight TAT cards. The themes suggested dependency needs of two types: (1) where the hero sought help from another and (2) where the hero was given some help or gift which was not socilited.

The "conformity situation" as described by Asch was used to obtain an index of "yielder" or "non-yielder".

Conclusion:

Subjects producing TAT themes of the hero seeking help in a problem situation or disturbed by the loss of love and support sources yielded to the incorrect group opinion more often than subjects not producing these types of TAT themes.

III-A-1

KATCHMAN, L. T., ANDREWS, T. G., and ROSS, S., "Effects of Stress and Anxiety on Performance of a Complex Verbal-Coding Task", J. Exper. Psychol., (1958) 55:559-563.

Purpose:

The study of the effects of ego-involvement, falsified knowledge of results and manifest anxiety on the flexibility of performance on a complex verbal-coding task.

Method:

The experiment was designed to determine the effects of two levels of anxiety, three levels of failure stress, and three levels of ego involvement on performance of a complex verbal-coding task. Time, error, and frequency of blocking scores were used as measures of performance. Time scores were recorded for both pre and post-stress trials while errors and blocks were scored only on post-stress trials.

Results:

It appeared that failure stress bore an inverse relationship to performance. The no stress group decreased their average time following the stress instructions, in addition to making fewer errors and blocks on the post-stress groups increased their average time following the imposition of stress.

In regard to anxiety classification, it appeared that high anxiety subjects were affected by stress to a greater degree than the low anxiety group.

Summary:

The results showed that both errors and frequency of blocking were independently sensitive to the anxiety and stress situations. On pre-stress trials the high and low anxiety groups were not found to differ significantly in terms of time taken to perform the test. On past-stress trials, the low anxiety group showed an increase in time. This was interpreted as a possible sensitizing function of anxiety to stress producing situations.

III-A-1

KAUSLER, D. H., TRAPP, E. P., and BREWER, C. L., "Intentional and Incidental Learning Under High and Low Emotional Drive Levels", J. Exper. Psychol., (1959), 58:452-455.

Purpose:

The purpose was to compare the amount of learning that takes place, both intentional and incidental, under different emotional drive levels.

Method:

For this study, two experiments were used. In Experiment I, the intentional task involved learning a serial list of 14 geometric forms. The learned response consisted of the anticipation of the next form in the series. Each form appeared twice in the series, and was associated with a different color both times. The color association was the incidental learning. A group of 50 students from the University of Arkansas was used for the study. Twenty-six students were rated as high anxiety subjects by the Taylor MAS and 24 students low anxiety. These subjects then learned the material individually with instructions to learn the series of geometric forms. The colors were not mentioned in these instructions. In Experiment II a different group of students was used. This group had the same learning situation as those in Experiment I. The group was divided arbitrarily into two groups; one a high anxiety group and another the low anxiety group. The same instructions for learning were given to both of these groups as in Experiment I. But the high anxiety group in this experiment were told they were taking part in a nation-wide study of state universities, and in the past Arkansas had been below the national average, so this year these students were urged to do their very best to keep Arkansas from being below the national average.

Results:

In Experiment I the high anxiety students were superior to the low anxiety in both intentional and incidental learning. But the difference was very slight in incidental learning and not statistically significant. In Experiment II the same results were obtained, the high anxiety group excelled in intentional learning but they were about equal in incidental learning.

Conclusions:

The two experiments related emotional drive level to intentional and incidental learning. In Experiment I, the drive was intrinsic, while in Experiment II, the drive was extrinsic. In both experiments the high incentive group displayed significantly greater intentional learning, but significantly less incidental learning than the low incentive group. In both experiments, the high drive group was superior to the low drive group in intentional learning, but did not differ in incidental learning. The results suggest that emotional motivation is more situationally oriented than incentive oriented motivation and less confined to the relevant task.

II-A-1

KAYE, D., KIRSCHNER, P., and MANDLER, G., "The Effect of Test Anxiety on Memory Span in a Group Test Situation", J. Consult. Psychol., (1953), 17:265-266.

Purpose:

To study the effect of test anxiety on memory span in a group test situation by examining the diagnostic value of a memory span test in differentiating two groups of subjects whose anxiety level has been independently measured.

Procedure:

Thirty-six college students who had taken an anxiety questionnaire were given a memory span test lasting twenty minutes. Seventeen subjects were taken from the over 13% of the distribution of anxiety scores. Nineteen subjects represented the upper thirteen percent of the distribution, and compared according to recall of words on the memory span test.

Conclusions:

The memory span test successfully differentiated two groups differing in anxiety level. The low anxiety group performed at a significant level above the high anxiety group. Also, the differential effect of anxiety levels operated in group situations as well as individual testing situations when instructions involving the ego were given.

III-A-1

LATANE, B. and ARROWOOD, A. J., "Emotional Arousal and Task Performance", J. Applied Psychol., (1963), 47:324-327.

Purpose:

This was designed to study the hypothesis that the effect of emotional disruption upon productivity is related to the extent to which an assembly operation is stereotyped. The authors suggested that emotional disruption will have little effect on a worker's performance on a habitual and practical task, but will hinder performance during task change over.

Method:

The subjects used for this study were 42 men enrolled in introductory psychology at the University of Minnesota.

The subjects were seated in front of a console on which was mounted three pilot lights and three switches. The pilot lights were lit sequentially and served in defining the correct response. Task one for the subjects was to anticipate the next light and press the corresponding colored switch. The procedure was divided into four periods. Period one was concerned with 12 minutes of training on task one. Period two involved introjection of an emotional instigator.

The instigator entered the room and proceeded to insult the subjects in the hostility group, thus causing emotional arousal. In the control group, the instigator did not insult or arouse the subjects.

Period three was the continuation of task one for three minutes. Task two was begun in period four. The total correct responses were computed for each group.

Results:

During period one, both groups performed equally well. During the two minute period two, the instigator's effect reduced the performance of the hostility group below that of the control group but not significantly.

With a continuation of task one in period three, both groups performed equally.

When the task change over was begun, the hostility group fell significantly below the control group and both groups fell below their previous levels. After the first three minutes of changeover, both groups, once again, had a comparable performance.

Conclusions:

Emotional arousal had no effect on the performance of a stereotyped task, but it had a considerable effect on task changeover.

III-A-1

LOWELL, E. L., "The Effect of Need for Achievement on Learning and Speed of Performance", J. Psychol., (1952), 33:31-40.

Purpose:

This experiment was designed to study the relationship of motivation strength to learning and speed of performance on two tasks with different susceptibility to improvement. The study was based on Miller's assumption that "the ultimate test of drive and reward will be in terms of their ability to produce learning and performance of new responses."

Subjects:

The subjects were 40 male college students.

Procedure:

Two tasks were constructed for the experiment. One was a scrambled word task in which the letters of familiar words were scrambled and the subject was instructed to rearrange them to make a word. On this task, learning could take place. The other task was an addition task in which the subjects added columns of numbers. No significant learning was expected to take place. The tasks were given to all subjects under carefully timed conditions.

Achievement motive was measured by showing each subject a series of TAT-like pictures and asking him to write stories about them. The stories were then analyzed for achievement need. The subjects were then divided into high and low achievement need groups.

Findings:

(1) The average performance of the high and low groups on the scrambled word task was not significantly different.

(2) There was a significant difference in the amount of improvement on the scrambled word task in favor of the high need for achievement group.

(3) The total output on the addition task was significantly higher for the high need for achievement group.

Conclusion:

Subjects with high need for achievement show evidence of increasing output or learning on a scrambled word task and an addition task where subjects with low need for achievement do not.

III-A-1

MANDLER, G., and SARASON, S. B., "A Study of Anxiety and Learning", J. Abnorm. Soc. Psychol., (1952), 47:166-173.

Purpose:

To investigate the extent to which anxiety responses are evoked in a testing situation and the relation of such responses to performance on typical intelligence test items.

Setting:

Thirty-three subjects at Yale University were chosen on the basis of a questionnaire concerning anxiety in four types of testing situations, and were placed in either a high or low anxiety group. These groups were divided into three sub-groups: success, failure, and neutral.

Procedure:

All subjects were given six trials each on Koh's Block Design #13 and the Digit Symbol subtest of the Wechsler-Bellevue Intelligence Test. Subjects were told either they had done "very well", "very badly", or just to go on to the second part.

In the second part, all subjects were given six trials each on the Koh's Block Design #16 and a comparable variation of the Digit Symbol Test.

Results:

(1) The low anxiety group received higher scores on the Koh's Block Design #13.

(2) The performance of the high anxiety was more variable.

(3) The anxiety drive of the high anxiety group tended to improve performance scores as the learning process proceded.

(4) An intervening report (success or failure) elicited improved performance for the low anxiety groups, but depressed scores for the high anxiety groups.

III-A-1

MARLOWE, D., "Relationships Among Direct and Indirect Measures of the Achievement Motive and Overt Behavior", J. Consult. Psychol., (1959), 23:329-332.

Purpose:

The purpose of this study was to determine the degree of relationship between two measures of n Achievement (the TAT fantasy method and the n Achievement scale of the PPS) and a criterion measure of overt achievement behavior; and to determine the degree to which the n Achievement measures yield equivalent scores.

Subjects:

Forty-four male fraternity members at Ohio State University.

Procedure:

Each subject wrote four minute imaginative (TAT-type) stories under neutral group conditions according to the standard procedure of McClelland. The fantasy n achievement scores were obtained by scoring the stories for Achievement Imagery and Achievement Thema. A measure of the interrater reliability was obtained by the writer with those independents obtained by another scorer.

Following the completion of the stories, the subjects were given 55 pairs of items from the PPS, 28 of which comprised the n achievement scale of the PPS. The remaining 27 items were used as buffers. The subjects were then administered a sociometric measure of achievement behavior which was adapted from Fitzgerald's measure of overt dependency. This instrument was based on a nominating technique, and served as the criterion measure, and yielded a quantified index of overt achievement behavior. Two descriptions were devised for the present study to describe the extremes of achievement behavior. The fraternity members then rated one another as to description fits. Each subject made three nominations of overt achievement striving or not.

Results:

There was no relationship between the PPS measure of the strength of n achievement and the sociometric index of overt achievement behavior.

There was a significant relationship between the fantasy measure and the sociometric ratings. The results indicated that the fantasy and the PPS tests are not equivalent measures of n achievement.

Conclusions:

It was concluded that for a college population the fantasy test appears to be more suitable than the PPS for the prediction of overt achievement behavior. The lack of relationship between the TAT fantasy test and the PPS was interpreted as being due to the different kinds of expectancies which the subjects developed in the fantasy and PPS situations.

III-A-1

MATARAZZO, J. D., ULETT, G. A., GUZE, S. B., and SASLOW, G., "The Relationship Between Anxiety Level and Several Measures of Intelligence", J. Consult. Psychol., (1954), 18:201-205.

Purpose:
This study was undertaken to determine whether a relationship exists between anxiety level and intelligence level.

Procedure:
There were 101 subjects who took three measures of intelligence. Each measure of intelligence was plotted as a function of anxiety level and statistical analysis was made of each of the two functional relationships. The groups were divided into seven subgroups according to anxiety scores.

Results:
For two measures of intelligence, grade point average, and CVS scores there was an insignificant Pearson r. For the ACE scores as a measure of intelligence, a time factor was used so that there was a negative correlation between ACE scores and anxiety level.

III-A-1

NICHOLSON, W. M., "The Influence of Anxiety Upon Learning: Interference on Drive Increment", J. Pers., (1958), 26:303-319.

Purpose:

To compare the verbal learning of high and low anxiety Ss under task-orienting and ego-orienting instructions in order to shed light on the stimulus vs. drive properties of anxiety.

Procedure:

Ss were picked from the upper and lower deciles of the Taylor Anxiety Scale. They were assigned randomly to either an easy or hard task, under either task or ego-orienting conditions. The tasks were two lists of 12 nonsense syllables which the subjects were to learn serially.

Results:

1. There was no significant difference in the performance of high and low anxiety subjects under task-orienting instructions.
2. The low anxiety subjects gave significantly more correct responses than the high anxiety subjects under ego-orientation.

Conclusions:

The results are interpreted as supporting the viewpoint that performance is influenced by responses elicited by anxiety as a stimulus rather than by the drive properties of anxiety.

III-A-1

SCHULTZ, R. E., and CALVIN, A. D., "Failure to Replicate the Findings of a Negative Correlation Between Manifest Anxiety and ACE Scores", J. Consult. Psychol., (1955), 19:223-224.

Purpose:

Attempt to substantiate the findings of Matarazzo, et. al., with respect to their conclusion that "anxiety appears to be moderately, although significantly, correlated with total ACE score and that the higher the anxiety level the lower, on the average, is the obtained score on this test."

Procedure:

Ninety-eight college students were used and were divided into four groups on the basis of their A scale scores of the Taylor Manifest Anxiety Scale. The Pearson r was then computed.

Findings:

From group procedure a correlation of .02 was obtained and from individual A scale scores, a correlation of zero was obtained.

A recitlinear relationship was indicated by the non-significant $X^2$ obtained from the $X^2$ test of goodness of fit.

Conclusion:

A possible explanation for the different findings might have been the influence of selection procedures producing a different type of student body. "Until more evidence appears to support the results of Matarazzo, et. al., it seems that a valid relationship between intelligence and scores on the Taylor Manifest Anxiety Scale has yet to be established."

III-A-1

SOLSO, R. L., "The Relationship Between the Ability for Originality and Personality Needs", Masters' Thesis, Dept. of Educ. Psychol. and Measmt., University of Nebraska.

Purpose:

The purpose of this study was to ascertain the relationship existing between the ability for originality and certain specified personality needs.

Method:

The Guilford's Test of Consequences was used to measure originality. The Edwards Personal Preference Schedule was used to measure personality needs. Subjects used were students enrolled in Educational Psychology.

Procedure:

The subjects were administered both tests. High and low creativity or originality groups were determined by using the upper and lower 27% of the students on the Guilfords Test. These two groups were then compared according to their results on the EPPS.

Results:

The results of the study did not indicate that there was a significant relationship between the personality needs of individuals as measured by the EPPS, and the ability for originality of the individuals as measured by the test of consequences. Only one personality need, exhibition, was significant.

Conclusion:

The results were mostly negative. This could possibly result from sample size, or from the difference in the groups from that on which the tests were standardized.

III-A-1

SPENCE, K. W., FARBER, I. E., and McFANN, H. H., "The Relation of Anxiety (drive) Level to Performance in Competitional and Non-Competitional Paired-Associates Learning", J. Exper. Psychol., (1956), 52:296-305.

Purpose:

To study the relationship of anxiety (drive) level to performance in competitional and non-competitional paired-associates learning.

Procedure:

Two experiments were involved in the study. In experiment one, a paired-associates list was used in which there was a minimum of competition among the paired words and in which the associative connections between the paired words were initially high. On each trial, correct anticipations, errors, or no response by the subjects were recorded.

In experiment two, competing response tendencies initially stronger than the correct responses were present. These responses were also recorded.

Results:

In experiment one with no competitional paired-associates, the high anxiety subjects were superior to the low anxious subjects. In experiment two, with competitional paired-associates, the low anxiety subjects were superior in performance to the high anxiety subjects. When the total responses were tallied for both experiments, the low anxiety subjects had a lower mean number of trials than did the high anxiety subjects.

III-A-1

TAYLOR, J. A., "The Effects of Anxiety Level and Psychological Stress on Verbal Learning", J. Abnorm. Soc. Psychol., (1958), 57:55-60.

Purpose:

To study the effects of anxiety level and psychological stress on verbal learning.

Method:

Both HA and LA subjects were divided into two groups each; a stress and a non-stress group. A practice list and two experimental lists were composed of eight pairs of nonsense syllables. The subjects were told that performance on learning tasks was related to IQ. Subjects were given 10 practice trials. All subjects were then given 15 trials on list one under no-stress conditions. Before taking the second list, stress group subjects were told their performance on the first list was poor.

Results:

On the first experimental list the HA group was superior. On the second list the non-stress groups improved while the stress groups did poorer work. Although the stress conditions interfered with performance, it did not interfere any more with the HA group than with the LA group.

Summary:

Results indicated that while high anxiety subjects under neutral instruction were significantly superior to the low anxious, as predicted, and the subjects operating under stress were inferior to their neutral controls, the predicted interaction between anxiety level and stress was not found.

III-A-2

CAREY, G. L., "Sex Differences in Problem Solving Performance as a Function of Attitude Differences", J. Abnorm. and Soc. Psychol., (1958), 56:256-260.

Purpose:

To test the following hypothesis: sex differences in problem-solving performance which are not the result of differences in general intelligence, special aptitudes, or information, are attributable to differences in attitude toward problem solving.

Method:

A Likert scale was constructed for problem-solving statements. By item analysis, 36 items were selected that differentiated between high and low scores at the .05 level. The 36 items were split into two groups of 18 items each (Form A and B). The following experiment was designed so as to measure attitude and performance before and after an attempt was made to modify attitude.

Sixteen groups of six subjects met together for a total of three hours, one hour on each of three successive days. Each group was composed of three men and three women. ' Most subjects were sophomores. During the first hour subjects were given one form of the attitude scale and ten problems to solve with a time limit of 40 minutes. The problems were ones which had previously differentiated between sexes, controlling for aptitude, etc. The second hour consisted of group discussion of some factors involved in problem-solving success such as attitude to problem solving and recognizing his or her own attitude toward problem solving. During the third hour, the alternate form of the attitude scale and 10 more problems were given. At no time was a reference made to the real purpose of the experiment, nor was the subject of sex differences introduced. There were four E's, two male and two female, each of whom worked with four groups of six subjects each. They administered the scales and problems and led discussions. As a group, women may have had less experience with the types of problems used and hence may show a greater practice effect. Therefore, control groups were set up that did not have a discussion period.

Results:

1. Can a scale be constructed that measures attitude toward problem solving? A reliable measuring instrument was constructed. Items that referred directly to interest in or frequency of problem solving were among the highly differentiating items in the item analysis. Additional evidence of validity was provided by the fact that the attitude scores and performance scores were positively related.

2. Is there a sex difference in such a scale? Men received significantly higher scores on the attitude scale than did women.

3. Is problem-solving attitude related to problem-solving performance? Correlations were computed separately in both the prediscussion and post-discussion testing sessions. Seven of the eight correlations were in the predicted direction. Only two were highly significant.

4. Is an attempt to change problem-solving attitude experimentally followed by a change in performance? A significant improvement in the performance of women indicated that the question could be answered in the affirmative.

5. Do women respond more favorably than men in an attempt to improve their attitudes? In order to answer this question, a two-way analysis of variance design was used to analyze the difference scores, with classification according to E and sex of subject. The sex difference in amount of improvement in performance was significant, women responding more favorably than men to the attempt to improve problem-solving attitude. The change in performance of the control groups was not significant for either sex.

Summary:

The attitude scale gave some internal evidence of validity, and men were found to have significantly higher scores on the scale than women. After the group discussion, designed to induce a more favorable attitude toward problem solving, women showed a significant improvement in performance, while men showed no change. The data indicated that improvement of attitude is at least a tenable one. In general, the findings support the hypothesis of sex differences in problem solving as a function of sex differences in attitude.

DORSEY, M. F., and HOPKINS, L. T., "The Influence of Attitude Upon Transfer", J. Educ. Psychol., (1930), 21:410-417.

Purpose:

The purpose of this experiment was to determine the variations in the amount of transfer depending upon readiness to act as built up by suggestion given at the time of performance.

Method:

Three groups were used in this study. The first group was composed of students who had failed in their college work the first quarter and were given special instructions on how to study. Measurement was based upon a ten-minute uncontrolled reproduction of ideas presented in a 24-minute reading of test materials and a true-false examination covering the same materials. The factor to be transferred was the "method of study." The experimental group was given the suggestion, "Use the method of study which you have learned in studying these paragraphs." The second group was made up of college freshmen in a Latin course. The factor to be transferred was "knowledge of Latin." The experimental group was given the suggestion, "Use your knowledge of Latin in determining the meaning of the words in the test." Measurement was based upon a test containing 100 Latin derivatives. The third group was freshmen engineering students. The factor to be transferred was "Skill in manipulation of special elements. Measurement was made by a speed test of arithmetic problems and writing as many words as possible from the work "material." The experimental group was given the suggestion, "Use your knowledge of descriptive geometry in answering the test questions."

Results:

In the first group, the total and mean scores of the experimental group are superior to those of the control group on both tests. In group two, the experimental group was superior to the control group in the average total number of words defined correctly. In the third group, the total and mean scores of the experimental group was higher than those of the control group.

Conclusions:

Since the experimental and control group were equated on the basis of intelligence and were equally trained in the factor to be transferred, it appears the superiority of the experimental group would be due to another influence, such as readiness to act.

III-A-2

**KISHLER, J. P.**, "The Effects of Prestige and Identification Factors on Attitude Restructuring and Learning from Sound Films", Psychol. Abstr., (1951), 25:1.

Purpose:

The prupose of this experiment was to study the effect that audience attitude toward and identification with the main character in a film has on learning from the film.

Subjects:

From a sample of 815 Introductory Psychology students, 4 subsamples were drawn. Two prestige samples were comparable with regard to aptitude (Pennsylvania State College Moore-Castore Test) and sex distribution, but differed with respect to the ranking they assigned to the occupation of Catholic priest. Every member of one group ranked the occupation high, the members of the other group,ranked it low. Two affiliation samples were also selected which were comparable in academic aptitude but which differed according to membership or non-membership in the Catholic Church.

Procedure:

The subjects were first administered an attitude scale to measure religious tolerance. They were then shown a dramatic film, "Keys of the Kingdom." This film depicted the career of a Catholic priest who served as a missionary in China, and developed a theme of religious tolerance. After the film, three devices were used to measure the effect of the film. They were (1) an alternate form of the attitude scale, (2) an objective test on the information contained on the film, and (3) the rank order scale of occupational prestige.

Results:

1. The attitudes of those who ranked the occupation Catholic priest high changed significantly (in the favorable direction). There was no significant change in the attitudes of those who ranked the occupation low.
2. There was no significant difference on information test scores of the prestige groups, although the high ranking group scored slightly higher.
3. Both before and after the film, Catholics assigned a significantly higher prestige rank to the role of the Catholic priest than non-Catholics. For both Catholics and non-Catholics a significantly higher prestige rank was assigned after the film.
4. The Religious Tolerance scale showed no significant difference between Catholics and non-Catholics in the amount of attitude change.
5. Catholics scored higher on the information test than non-Catholics. The difference was barely significant at the .06 level.

III-A-2

ROKEACH, M., "Attitude as a Determinate of Distortion in Recall", J. Abnorm. Soc. Psychol., (1952), 47:482-488.

Purpose:

To study the effects of prejudice on recall and on the degree of distortion of the material recalled.

Procedure:

Photographs of negros and whites with various emotionally toned and neutral names attached were presented to subjects relatively high or low in prejudice. The subjects were to evaluate the photographs (which were standard front pose police pictures) for friendliness-unfriendliness during presentation and to recall as many as possible after presentation.

Results:

1. The frequency of recall of the various names to the negro and white faces were not significantly different from each other.
2. No significant differences were found in thr frequency of recall of the various names to photographs perceived as friendly or unfriendly.
3. The high prejudice group recalled the names, Gray, Green and Lynch significantly more than the low prejudice group to both negro and white faces.
4. The low prejudice group recalled the name Jones or gave no response significantly more than the prejudiced group to both negro and white faces.

**WEISS, W.**, "The Relationship Between Judgments of a Communicator's Position and Extent of Opinion Change", J. Abnorm. Soc. Psychol., (1958), 56:380-384.

Purpose:

To examine the relationship between judgments of a communicator's position and the extent of the audience's opinion change.

Setting:

Two experimental groups were exposed to a communication on juvenile delinquency and one control group was not.

Form A of the Wang-Thurstone was used to measure the subject's judgment of the communicator's position toward treatment of the criminal. Form B was used to measure the opinion position of the subjects.

Results:

It was the group exhibiting the more extreme judgment of the communicator's opinion position that showed the greater effect of the communication. The after-mean of each experimental group was significantly more punitive than that of the control group.

Judgment of communicator's position was not found to be related to own opinion, in most cases.

A multiple choice measure of judgment of trustworthiness was administered. It was found that the judgment of trustworthiness of the communicator was negatively related to the extremeness of judgment of the communicator's opinion position.

The judgment dimension does not seem to be related in a simple manner to the difference in effectiveness of the two communications.

III-A-6

ALLISON, S. G., and ASH, P., "Relation of Anxiety to Learning from Films", Pennsylvania State University Instructional Film Research Program, Port Washington, New York, U. S. Navy Training Devices Center, Office of Naval Research, Tech. Report No. SDC 269-7-24.

Purpose:

The purpose of this study was to investigate the effects of chronic and situational anxiety have on how much an individual learns from selected instructional films presenting complex learning materials.

Subjects:

The subjects for the study were 480 Introductory Psychology students.

Procedure:

Two identical studies were carried out. The second served as a check on the first.

The sample of students for each study (237 in the first and 243 in the second) was divided into four groups. Three of these groups (experimental) were given a scale to measure their level of chronic anxiety. Several weeks later, each of the experimental groups was given a different series of instructions aimed at lowering their anxiety (the film is easy, etc.), the second group was given neutral instructions, and the third group received questions designed to increase their anxiety (they were told that the film was difficult and that if they did not learn the material they did not belong in college). Each of the three groups then saw a film and took a test on the material covered in the film. The fourth (control) group took the test without seeing the film.

Results:

1. Students who received anxiety-producing instructions had higher learning scores than students who received either neutral or anxiety-relieving instructions. The difference between the test scores of those receiving anxiety-producing and anxiety-relieving instructions was significant at the .001 level.
2. Students who received neutral instructions had higher learning scores than those who received anxiety-relieving instructions.
3. The correlation between anxiety test scores and learning scores was around 0.
4. When the learning test scores of the top 15% on anxiety were compared with the bottom 15% on anxiety no significant difference was found.
5. These findings held true for both studies.

Conclusions:

1. Anxiety produced by the use of suitably worded instructions can have a beneficial effect on the learning of complex materials from films.
2. Within the range of chronic anxiety which was found in the particular sample used in this experiment, there appears to be no relationship between various levels of chronic anxiety and the amount of learning from films.

ANGELL, D., and LUMSDAINE, A. A., "The Effects of Prompting Trials and Partial-Correction Procedures on Learning and Anticipation", Symposium on Programmed Instruction, San Mateo, California, American Institute for Research, Sept. 1961, Report No. AFOSR-TN-61-1343, 502-503.

Purpose:

To provide data on the relative effectiveness of prompting trials and anticipation (confirmation) trials, and on the effectiveness of partial cueing.

Procedure:

Two independent but similar experiments were carried out using paired associates and varying: (1) the number of prompting trials (0, 1, 2, or 3) and (2) the degree of correction following errors on anticipation trials (ranging from simple right or wrong to giving the correct answer). Following partial correction, the subject either went on to the next item (Experiment I) or kept trying until he gave the correct answer (Experiment II).

Results:

The results of Experiment I indicated that: (1) a prompting trial was more effective than an anticipation trial when partial correction was employed but not when full correction was employed, and (2) full correction was superior to partial correction when there had been no initial prompting trials but not when there were two or more prompting trials. These results were not confirmed by Experiment II. This is interpreted as being a result of the difference in the correction procedures used in the two experiments.

Conclusions:

The prompting method can, under suitable conditions, be highly efficient for teaching tasks of the type used in the experiments.

III-A-6

ASH, P., "The Relative Effectiveness of Massed Versus Spaced Film Presentation. Technical Report No. SDC 269-7-3, Pennsylvania State University Instructional Film Research Program, Port Washington, New York, U. S. Naval Special Devices Center, Office of Naval Research, June 1949.

Purpose:

To determine if the learning of a body of information is greater when it is presented in one long film session than when it is broken up into two or more film sessions. And to determine the relationship learning and film interest measured as a function of film length.

Procedure:

Two similar experiments were carried out using groups of psychology students and navy recruits. Each group was shown the filmed material on from one to four sessions. Immediately after each film session each group filled out an interest rating form. After one or two weeks each group was tested on film content. Control groups who did not see the film at this time were also tested.

Results:

1. The differences between the massed and spaced presentations as measured by the film test, were not significant.

2. The differences between the control and experimental groups were highly significant.

3. The correlations between interest ratings and test scores were near zero.

Conclusions:

1. Training film sessions can last as long as one hour and still result in significant learning.

2. Within the time limits of the study, subjects do not seem to find long sessions less interesting than short sessions and the learning accomplished seems to be relatively independent of expressed interest.

III-A-6

COULSON, J. E., and SILBERMAN, H., "The Effects of Three Variables on a Teaching Machine", J. Educ. Psychol., (1960), 51:135-143.

Purpose:

To investigate three variables related to teaching machine design.

Procedure:

Groups of subjects were trained on manually operated teaching machines which allowed the variation of the following characteristics: (1) mode of response - multiple choice vs. constructed response, (2) size of step, and (3) item sequence - branching vs. non-branching. The subjects were tested before, immediately after and three weeks after the experiment.

Results:

1. Small item steps required significantly more time but yielded significantly higher test scores.

2. Branching conditions required less time but did not yield significantly different scores.

3. There was no significant difference in the scores produced by the two response modes.

Conclusions:

1. Small steps between items are more effective in producing learning.

2. The multiple choice method of response seems to be the best mode of response (considering time).

3. Branching appears to offer an overall advantage over non-branching.

III-A-6

EVANS, J. L., GLASER, R., and HOMME, L. E., "A Preliminary Investigation of Variation in the Properties of Verbal Learning Sequences of the Teaching Machine Type", Teaching Machines and Programmed Learning, Washington, D. C., National Education Association, (1960), 446-451.

Purpose:

This paper reports the results of five experiments studying (1) the effects of varying the number of steps in a teaching program, (2) the effects of writing or not writing a response to each item, and (3) a comparison of the effectiveness of sequence learning and textbook presentation of the same material.

EXPERIMENT I

Procedure:

Four versions of a learning sequence designed to teach "conversion to number bases other than 10" were produced. The sequences used 30, 40, 51, and 60 steps respectively. Four independent groups of 5 subjects each, who were graduate education students, were given the sequence. Upon completion of a sequence, performance measures were taken by means of a written test.

Results:

Analysis of the results indicates that smaller steps were associated with significantly fewer errors on immediate and delayed performance tests. However, it appears that there is a limit beyond which it does not pay to extend the number of steps. Smaller steps were also associated with less time per step fewer errors in the course of learning.

EXPERIMENT II

Procedure:

In this experiment two groups of undergraduate psychology students studied a sequence on the fundamentals of music. The first group (five subjects) went through the sequence producing one or more written responses at each step. The second group (five subjects) went through the sequence but did not write any responses. Following the sequence the subjects were given a performance test.

Results:

The group which did not write their responses did better, but not significantly so, on the performance test. This group also required less time to complete the sequence.

EXPERIMENT III and IV

Procedure:

In experiment III a group of 17 undergraduates in psychology was given material covering 10 pages in a standard statistical text. A second group of 16 was given a learning sequence (programmed text) covering the same material. After a study period they were given a test over the material. Experiment IV was a repeat of experiment three with different subjects and using a different post-test.

Results:

In both experiments III and IV the subjects who received the learning sequence had a higher mean performance score but the difference was not significant. Also, the learning sequence subjects displayed significantly less variability in their scores.

EXPERIMENT V

Procedure:

Experiment V was conducted in the same manner as experiments III and IV except that the subject matter was fundamentals of music.

Results:

The learning sequence group performed significantly better ($p = .05$) on a test of identification of musical notation. The learning sequence group also displayed less variability in its scores.

Since the results of experiments III, IV, and V all gave some indication of tendency toward statistical significance, the three probability values were combined. The resulting chi-square value of 13.05 for six degrees of freedom was significant at the .05 level.

The learning sequence groups also take significantly more time to complete their sequences than do textbook groups.

III-A-6

FREEMAN, J., and NEIDT, C. O., "Effect of Familiar Background Music Upon Film Learning", J. Educ. Res., (1959), 53:91-96.

Purpose:

This study was designed to test the hypothesis that "familiar music distracts from the visual and verbal elements of the film."

Setting:

Group 1 (93 Subjects) were shown the familiar music version of the film.

Group 2 (94 Subjects) were shown the unfamiliar music version of the film.

Controls:

Music identification, music familiarity and individual differences in learning aptitude between the two groups were controlled.

Procedure:

Subjects were told that they were participating in a film learning experiment, that they would see a ten-minute film, and that they would be given 15 minutes to respond to the items on the film test. Following this, the music literacy test and the vocabulary test were administered.

Results and Conclusions:

The hypothesis that "there is no significant difference between the two film test means with scores on the music identification test, music familiarity test, and vocabulary test controlled" was not rejected. The final conclusion drawn was that "no significant difference was found between the film test means of the two groups."

III-A-6

HALL, J. F., "Learning as a Function of Word Frequency", Amer. J. Psychol., (1954), 67:138-140.

Purpose:
To determine if words that appear with high frequency in the language are learned more rapidly than those of low frequency.

Procedure:
Two hundred twenty-seven college students were split into nine groups of 20 to 30 each. Using the Teacher Word Book of 30,000 words, by Thorndike and Lorge, four lists of words were identified, each list having a different occurrence count per million words. By means of a slide projector, each word from one of the lists was presented to a group for 5 seconds with about 120 seconds required to present the total list. Four such presentations were made with 30 seconds allowed for rest periods between each. Paper was distributed after the last trial and the subjects were given 5 minutes to print as many of the words as they could recall.

Performance was measured in terms of the number of words correctly recalled.

Conclusion:
The more frequent a word appears in the language the more readily it is learned.

III-A-6

**HIRSCH, R. S., "The Effects of Knowledge of Results on Learning of Meaningful Material", Pennsylvania State University Instructional Film Research Program, Port Washington, New York, U. S. Naval Training Devices Center, Office of Naval Research, Tech. Report No. SDC 269-7-30, September, (1952).**

Purpose:

To investigate the effects of knowledge of results on the learning of meaningful material by highly motivated subjects.

Procedure:

A Latin-square experimental design was used to present six training films to six groups of NROTC midshipment under six experimental conditions. Four of the conditions used the classroom communicator to inform the subject that he had or had not chosen the correct answer to a multiple choice question. Two of the conditions served as controls. A post-test was given three weeks after the training was completed.

Results:

1. There was no significant difference in the performance of the subjects under the different methods on the immediate test.
2. Comparison of immediate and post-test scores revealed lower post-test scores on 5 of the 6 methods (four were significantly lower). The sixth method (film, test with immediate knowledge of results, and the film repeated) resulted in significantly higher scores on the post-test.

Conclusions:

Knowledge of results, given item by item, aids retention of learned material. If the film is repeated, not only is retention aided, but also some learning occurs.

III-A-6

HORLAND, C. I., "The Role of Primacy and Recency in Persuasive Communication", In Readings in Soc. Psychol., (Third Ed.) 137-149.

Purpose:

To investigate whether the point of view that the individual hears first in a controversial issue plays a more important role than any subsequent point of view.

EXPERIMENT I:

Subjects:

The study was performed at Hofstra College and Columbia University in a series of undergraduate psychology classes. A total of 357 students participated.

Procedure:

A list of propositions was presented accompanied by a scale of beliefs which ran from +10 (belief allowing for no doubt) to -10 (disbelief allowing for no doubt). Subjects were instructed to check the number corresponding to the extent to which they felt inclined to affirm or deny the validity of the proposition.

Two of the topics found to be most effective by Lund were used for the communications: "Should all men have equal political rights?" and "Is the protective tariff a wise policy for the U. S.?"

Material was presented to the subjects to read. Ten minutes were allowed for the reading of each side. Counterbalancing was employed by starting half the subjects with a negative and half with the positive.

As in the original Lund experiment, one group was given the rating scale for belief after the first side had been read. Two other groups were given the belief scales after the two versions had been read.

Results:

Under the conditions originally used by Lund only one group showed primacy (when the material presented first had a greater effect) (P = .01); the other two showed insignificant recency (when the second side was more persuasive) effects. When the opinion questionnaire was omitted after the first side was presented, two of the groups showed primacy and one recency. These effects were small and nonsignificant. The omission of the intervening questionnaire did not have any consistent effect; it increased the amount of primacy for one topic and decreased it for the other. But in neither case was the difference statistically significant.

Because no clear cut primacy effect was present in this first experiment, it was thought desirable to run a straight repetition of the Lund condition using topics of greater current interest.

EXPERIMENT II:

Procedure:

New communication materials dealing with the issues "Antihistamines should be sold without a prescription" and "an atomic submarine is feasible at the present time" were used. The instructor administered an opinion questionnaire concerning these issues two days before the communications were presented. A seven-point rating scale for degrees of belief was used. Half the subjects read the positive argument first, while half read the negative first. In addition to the before and after questionnaires, half of the classes took the same questionnaire between the two communications.

This experiment was performed at New York University in a series of ten psychology classes. In all, 191 subjects participated.

Results:

Only one of the four groups showed evidence of primacy and this was only significant at the .08 level. The results of this experiment cast doubt on Lund's findings. The condition of motivation probably played the most significant role in Lund's study. In this study, the experimenter was presumably the subject's regular classroom instructor. Under these conditions it would be expected that the motivation to learn the first-presented material would be derived from perviously encountered classroom situations in which the material presented by the teacher had to be learned. The students may have thought that the first presentation was "sponsored" by the instructor.

Further studies for determining the conditions which operate to make the first side more effective under some circumstances, the second under others, and both sides equally effective under still others were suggested by the author.

Summary:

The combined findings of this and similar studies suggest that "the side of an issue presented first is likely to have a disproportionate influence on opinion under the following conditions:

1. When cues as to the incompatibility of different items of information are absent.
2. When the contradictory information is presented by the same communicator.
3. When committing actions are taken after only one side of the issue has been presented.
4. When the issue is an unfamiliar one.
5. When the recipient has only a superficial interest in the issue."

III-A-6

KAESS, W., and ZEAMAN, D., "Positive and Negative Knowledge of Results on a Pressey-Type Punchboard", J. Exp. Psychol., (1960), 60:12-17.

Purpose:

This study was designed to investigate the effects of positive and negative knowledge of results on the learning of items presented on a Pressey-type punchboard and to evaluate the importance of behavioral feedback on this learning.

Procedure:

Six groups of Introductory Psychology students (88 to 62 students in each group) were given a test booklet containing 150 multiple choice items and an IBM answer sheet stapled to a cardboard template. One set of 30 items was used and repeated in 5 different sequences giving each S five trials on each item. The subject received immediate knowledge of the results when he punched (or attempted to punch) a hole in the paper. The independent variable, the amount of negative information, was manipulated by varying the number of item choices available to the subject on trial 1. Condition 5 offered 5 choice items, condition 4 offered 4 choice items, etc. As a control, the sixth group was given the five choice items but was not given knowledge of the results.

In the second part of the study, an effort was made to evaluate the importance of behavioral feedback, the reinforcement value of punching on a punchboard. The test booklets for the first trial of conditions 1 and 5 by marking with a red pencil the correct answer. The Ss were instructed to read carefully all available choices and to note the correct answer. Then on trials 2-5 they used the template. A third condition was established using the 5 choice items and telling the subjects the correct answer on the first trial.

Results:

1. The subjects in condition 5 and the control group used the same tests. There was a significant difference (.001 level) in the number of errors.

2. There was a significant difference in the number of errors made under the 5 conditions on trial 2. The more choices, the greater number of errors.

3. Item analysis revealed that item difficulty may be related to the effect of negative information since negative information seemed to have little effect on easy items but a strong effect on the difficult items.

4. Examination of the error vs. trials curves indicated that the 5-choice punchboard rapidly reduced errors on beginning trials but soon reached a point of diminishing returns.

5. In the second part of the study, there was no significant difference in the performance of Ss who were given the correct answer on the first trial and of Ss who found the correct response by punching. Behavioral feedback did not seem to facilitate learning.

Conclusions:

1. Negative information increases the probability that S will repeat his error.

2. The presence or absence of overt behavior does not seem to influence the learning of multiple choice items.

III-A-6

KRUMBOLTZ, J. D., and WEISMAN, R. G., "The Effect of Overt Versus Covert Responding to Programmed Instruction on Immediate and Delayed Retention", J. Educ. Psychol., (1962), 53:89-92.

Purpose:

This study was designed to study the relative effectiveness of overt and covert responses in programmed instruction.

Procedure:

Fifty-four students were given a programmed textbook. The subjects were assigned to four treatment groups: (1) a group that was to write down their answers, (2) a covert group which was to mentally compose a response, (3) a reading group which had the answers written in the blanks, and (4) a control group which was given a program on a different topic. A criterion test was given at the end of the test period, and an alternate form was given (two weeks later).

Results:

The immediate criterion test mean of the written response group was significantly higher than the control group. On the alternate test given two weeks later the written response group scored significantly higher than all the other three groups.

Conclusions:

The results showed that written responses to programmed materials are more effective than covert responses in helping an individual retain new learning for longer periods of time.

III-A-6

LAFFAL, J., "The Learning and Retention of Words With Association Disturbances", J. Abnorm. Soc. Psychol., (1955), 47, H2 Supp., 454-462.

Purpose:

The purpose of this study was designed to test the two hypotheses:

1. There is no difference in the number of trials required to learn words with association disturbances and words without association disturbances to a given learning criterion.

2. There is no difference in the retention of words with association disturbances and words without association disturbances over a period of time.

Procedure:

There were three basic phases:

1. Word association test. The subjects response, and reaction time were recorded for each stimulus word.

2. Learning of twenty words; ten with and ten without association distrubances. The words were then matched with pictures and the subjects were instructed to remember which words went with which picture.

3. Tests of retention of the learned words at varying intervals.

Experimental Design:

For each subject three measures were secured:

1. The number of trials in the original learning of disturbing and neutral words to the criterion of one correct response to each stimulus-picture.

2. Number of disturbing and neutral words recalled in the "free" recall period.

3. Saving score for disturbing and neutral words, i.e., the number of trials required for original learning minus the number of trials required to relearn the words.

Results and Conclusions:

1. Disturbing words took significantly more trials to learn than neutral words.

2. There was no difference in retention of disturbing and neutral words which could be attributed to the disturbance factor.

3. Repression theory was substantiated by the finding that disturbing words took significantly longer to learn than neutral words.

III-A-6

MARGOLIUS, G., and MACCOBY, N., "Methods of Combining Practice with Filmed Demonstration in Teaching Complex Response Sequences", American Psychologist, (1956), 11:444.

Purpose:

This study was designed to investigate the optimum methods for combining filmed demonstrations and practice in learning a lengthy, complex, serial manual task.

Procedure:

Four learning conditions were used in which the learners saw the filmed demonstration three times before a final test. The timing of demonstration and practice used prior to the final test.

Results and Conclusions:

The results indicate that when training is in accordance with theoretically prescribed demonstration and practice segments, or when demonstration and practice segments are lengthened during succeeding trials, performance of the task is optimum. When training segment length exceeds the theoretically prescribed length, test performance is lowered.

III-A-6

MATTSSON, P. O., "Communicated Anxiety in a Two-Person Situation", J. Consult. Psychol., (1960), 24:488-495.

Purpose:

To test the hypotheses that: (1) a person who interacts with a more anxious person will himself become more anxious, (2) a person who interacts with a less anxious person will himself become less anxious.

Method:

Subjects who were male college students were randomly paired and assigned to an experimental session or to either of two control sessions. All of the pairs were asked to perform a cooperative work task, a puzzle, the purpose of which was to provide an appropriate means of bringing the partners together in interpersonal interaction. In the experimental session, one person received electric shock while his partner received none. The purpose of the shock was to induce anxiety. The extent to which this anxiety was communicated was measured in three ways: changes in blood pressure, finger sweat and scores on a rating scale.

The first hypothesis was tested by comparing the anxiety change of the non-shocked subject in the experimental session with anxiety change of non-shocked subjects in a control group where the subject was shocked.

The second hypothesis was tested by comparing the shocked subjects of the experimental group with shocked subjects in a control group where both received shock.

Results:

The results supported hypothesis 1 for all 3 measures of anxiety. For hypothesis 2 the findings did not support the hypothesis for any anxiety measure used. An additional finding was that the measures of anxiety did not correlate with each other for the groups of anxious subjects. Where minimal anxiety was present, significant r's were evident.

Conclusion:

The experimental design had less power to show communication of comfort than communication of anxiety.

III-A-6

McTAVISH, C. L., "Effect of Repetitive Film Showing on Learning", (Pennsylvania State University Instructional Film Research Program), Port Washington, N. Y.: U. S. Navy Training Devices Center Office of Naval Research. Technical Report No. SDC 269-7-12, (1949).

Purpose:

The purpose of this study was to determine the increment in learning that may be attributed solely to one, two and three repetitions of a film, over and above a single showing.

Subjects:

The subjects for the study were 319 college freshmen enrolled in twelve sections of a science survey class at the Pennsylvania State Teachers College.

Procedure:

Four general science films were shown to each of four groups of subjects in such a way that each group saw each of the films once, a second film twice, a third film three times and a fourth film four times. No two groups saw the same film the same number of times. A multiple choice objective test was developed to measure learning from each test. Two weeks before the scheduled film showing the experimental groups were given a pretest covering all four films. This pretest was a scrambled form of the individual film tests. The films were then shown rotating the films and groups. A film was shown the required number of times in one class period time and the test on that film was given two days later.

Results:

1. In every case the difference between pretest and post-test scores was highly significant indicating that every group learned from every film.
2. Analysis of the learning gains attributable to each additional showing of the films indicated that the first repetition (i.e. two showings) resulted in substantial increments in learning. Three showings failed to add significantly to the learning effected by two showings. Four showings resulted in an even smaller increment (and in two cases a slight decrement over three showings).

Conclusions:

1. The films were effective in teaching at least some of the tested information. After one showing only there was a significant improvement in test scores.
2. For factual films, of the type used in the study, showing them twice results in appreciably more learning. Showings after the first two contribute little more to learning, and the drop-off is very rapid.

III-A-6

MILLER, J., and LEVINE, S., "A Study of the Effects of Different Types of Review and of "Structuring" Sub-Titles on the Amount Learned from a Training Film", Washington D. C., U. S. Air Force Human Resources Research Laboratories, HRRL Memo, Report No. 17, March 1952, Symposium on Programmed Instruction, 1961, Publication 943, National Academy of Sciences, National Research Council, Washington, D. C., (1961), 519-520.

Purpose:

To ascertain the effects on learning from films of: (1) variations on review conditions and (2) sub-titles which serve to structure the contents of the film for the student.

Procedure:

Several versions of a film on Ohm's Law provided the learning material. There were four review conditions: (1) massed review; (2) spaced review; (3) spaced oral review; and (4) no review. The three sub-title conditions were: (1) major subtitles only; (2) complete subtitles; and (3) no subtitles. A 4 x 3 design was used to vary the conditions. Comparable groups of high school students served as subjects.

Results:

1. Only the massed review condition was found to be significantly superior to the no-review condition.
2. No significant differences were found among the subtitle conditions.

III-A-6

MURNIN, J. A., HAYES, W., and HARBY, S. F., "Daylight Projection of Film Loops as the Teaching Medium in Perceptual-Motor Skills Training", (Pennsylvania State University Instructional Film Research Program), Technical Report No. SDC 269-7-26, (1952).

Purpose:

This study was designed to investigate the practical implications of the finding (SDC 269-7-25) that film demonstrations are at least as effective as a live instructor's deomonstrations in the learning of a perceptual motor task.

Subjects:

Seventy-nine men (four classes) enrolled in physical education classes at Pennsylvania State University served as subjects.

Procedure:

All classes participating in the study were equated on the basis of the Metheney Motor Skills Test. Two groups were then taught eight tumbling tasks by film and were supervised by an inexperienced instructor who could not perform the tasks. The other two groups were taught by an experienced instructor using conventional teaching methods. The films presented two-minute demonstrations of the skills, and were shown using the interspersed movie technique in which the film is shown for two minutes, then two minutes of practice, the film is repeated, etc., for a total of twelve minutes.

A check list for daily successes was kept by instructors of both groups. Written criteria were provided for what constituted a successful performance on each skill. The final performances were rated by independent judges. These ratings were used in the statistical evaluation.

Results:

1. The difference between the two film-taught and instructor-taught groups was significant at the .01 level in favor of the instructor-taught groups.

2. The total number of daily successes for the instructor groups was 12.26; for the film groups, 10.10. Thus, the learning by the film-taught groups was 83% of the learning achieved by the instructor-taught groups.

Conclusions:

1. Learning for the film-taught groups did occur to a significant extent and can be largely attributed to film demonstrations.

2. Live instruction as measured by final performance was superior to film instruction.

3. Using daylight projection of film loops, instructors with a minimum amount of training and experience can teach perceptual motor skills with an effectiveness approaching that achieved by expert instructors using live demonstrations.

III-A-6

POSTMAN, L., and SCHNEIDER, B. H., "Personal Values, Visual Recognition and Recall", Psychol. Rev., (1951), 58:271-284.

Purpose:

1. To obtain additional information on the relationship between personal values, frequency of usage and perceptual recognition thresholds for words.

2. To investigate the relationship between personal values, frequency of word usage and memory.

Procedure:

A list of 36 words was constructed with the six value areas of the Allsport Vernon study of values. The words were presented for recognition in a tachistoscope. The duration threshold for each word was determined by the method of limits. Within each value area, a group of three relatively frequent and three relatively infrequent words were used. Thus the effect of word frequency, of value rank, and the interaction of the two factors could be gauged.

The relation of personal value to recall was tested by asking the subjects to write down as many of the words as they could, immediately following the recognition part of the study.

Results and Conclusions:

An analysis of variance showed that duration thresholds varied significantly as a function of both frequency and value rank. The two factors worked together.

As far as memory was concerned, it was found that more frequent than infrequent words are recalled. There was a suggestion of a U-shaped relationship between value rank and recall. Value rank made more difference in the recall of infrequent words than frequent words.

III-A-6

PRESSEY, S. L., "Development and Appraisal of Devices Providing Immediate Automatic Scoring of Objective Tests and Noncomitant Self-Instruction", Teaching Machines and Programmed Learning, Washington, D. C. National Association, (1960), 69-89.

Purpose:

The purpose of this paper is (a) to describe means by which tests may be made self-scoring and self-instructional, (b) to investigate the way in which such devices work, and (c) to determine their value in educational or training programs.

Procedure:

This paper reports the results of several studies using the Pressey Punchboard as an instructional device. In each study, the subjects (introductory Psychology students) took multiple-choice tests responding on the punchboard which immediately informed them of the correctness of their response. The tests, which were presented on mimeographed sheets, consisted of material on Russian vocabulary, English vocabulary, and Psychology. For some of these tests, several forms were available which used different keys.

The several studies used various combinations of the following variables: (1) number of repetitions, (2) time between repetitions, and (3) use of different keys. The effectiveness of the punchboard as an instructional device was evaluated under several conditions.

Results:

1. When the test was repeated immediately, the number of errors were markedly reduced. For the Russian vocabulary, errors were reduced from 12 to 8, for the English vocabulary, the errors were reduced from 43 to 7, and for the psychology items, errors were reduced from 18 to 2.

2. When a multiple-choice Russian test was used with the punchboard, and then followed by a test of a different type (recall) there were fewer errors on the second test, however, improvement was not as marked.

3. In order to determine the effects of several consecutive repetitions of a test using the punchboard, one group was given Russian, English, and psychology tests which were repeated four times and followed by a recall test. A second group was given five different versions of the same tests, followed by a recall test. The results show a decrease in errors with each repetition except for the second group's Russian scores in which there were more errors on the second test than on the first. There was no significant difference in the recall tests of the two groups on the three tests.

4. In another study, two groups of psychology students were given two trials using the punchboard to study 60 objective test items. The next day they were given their regular midterm examination. Twenty-one of these items were repeated or rephrased from the earlier test. The results indicated that the punchboard reduced errors most on the repeated questions, although some gain appeared on the rephrased items.

5. To evaluate the punchboard as a major instructional device, four Educational Psychology classes used the punchboard and practice tests (two trials per test), two classes used the practice tests (but not the punchboard), responding on answer sheets and then discussing the questions. Seven other classes then served as control groups. A 75 item multiple-choice mid-term was then given to all classes. Of these 25 were repeated or paraphrased. The punchboard classes were found to be significantly superior to both the control groups and the groups which answered the test but did not use the punchboard. The latter groups were superior to the control groups.

6. The final group concerned the use of punchboard practice tests with groups of superior students. Three groupings were investigated.

a. In the first, exceptional students from Educational Psychology classes were placed in seminar type classes. Practice tests and punchboards were made available for them to use as they pleased. For purposes of evaluation, each student was paired (using age, sex, and ability) with members of a regular class. The percentage of seminar students receiving A's and B's in the course was much higher for the seminar students.

b. In the second study, two groups of superior students from the Educational Psychology classes were given four hours of orientation and then placed on their own. They were given the practice tests and punchboards to use as they pleased. Time was made available by the instructor for consultation. These students were also matched with other students. All of the students (both subjects and their pairs) received A's and B's.

c. In the final study, superior students were given a list of the work in the course. They were given access to a self-instructional laboratory, in which all materials and readings for the course and a complete set of punchboard tests were provided. Each student then worked at his own rate. All of these students received A's and B's on the course final.

Conclusions:

1. A testing process which informs the students immediately as he answers each question whether his answer is correct and which guides him to the right answer when he is wrong, transforms test taking into self-instruction.

2. When used systematically in college courses, self-instruction tests can be a valuable teaching aid.

III-A-6

PYLE, W. H., "Is Individual Learning Capacity Constant for Different Types of Material?", J. Educ. Psychol., (1919), 10:121-128.

Purpose:

To determine if the characteristics of the nervous system are such that a person in general may be spoken of as a "good learner" or a "poor learner."

Procedure:

Several hundred university students were measured in their ability to learn four different types of material (viz. substitution, nonsense syllables, card distribution and marble distribution). The substitution and nonsense-syllable learning tests were types of intellectual learning. Card and marble distribution represented motor learning.

Results:

The average of the "raw" correlations between one type learning and the other types was approximately .50. It was explained that the "true" correlations would be higher had other outside experiences of the subjects been partialed out.

Conclusion:

"There is probably a constant factor which may be called general learning capacity, dependent upon the characteristics of the central nervous system."

III-A-6

ROMNEY, A. K., "Effects of Selected "Set"-Inducing Instructions Upon Learning From Multiple Film Showings", Boston, Massachusetts, Boston University, Unpublished Report, Contract No. AF 33(038)-22944, September 1952, Symposium on Programmed Instruction, 1961, Publication 943, National Academy of Sciences, National Research Council, Washington, D. C., 1961, 522-524.

Purpose:

This experiment attempted to investigate the effect of set-inducing instructions on learning, from repeated showings of a film.

Method:

Subjects were summer-session college students. Subjects were shown a movie either two or three times. Part of the subjects were given concepts of the movie concerning the topics ("Principle" set-inducing) while the remainder were given factual content of the film. ("Fact set inducing). All subjects were told they would be tested on the film. The results of the tests were compared.

Results:

Set-inducing instructions have a favorable effect upon learning. "Fact" set-inducing has a greater overall effect on increasing learning than "Principle" set-inducing. When two showings were made, each preceded by different set-inducing instruction, there was no significant gain in learning over just one set of instruction. There was not a significant increase in learning with three showings rather than two.

RUBENSTEIN, H., and ABORN, M., "Learning, Prediction, and Readability", J. Applied Psychol., (1958), 42, 1:28-32.

Purpose:

The purpose of this study was to determine the interrelationship of the readability of material, the ease with which the material is learned, and the degree to which succeeding words are predictable.

Procedure:

Materials consisted of thirty passages, of varying difficulty, of approximately 200 words each. Each passage was reproduced on a sheet of paper with each sentence beginning a new line.

One hundred and twenty-five students composed the learning group. Thirty-seven students were in the prediction group. Both groups practiced memorizing English passages. The learning group was divided into five matched groups. Each subgroup was administered the passages. Study time intervals and heading difficulty were at random. At the end of each interval, subjects recorded what they remembered. The prediction group was given a word of a passage and instructed to guess the next word.

The results of the two groups were then compared.

Results:

Learning, prediction, and readability are all closely interrelated. Prediction and readability correlate about equally well with learning.

Conclusions:

The method of prediction used, based on one guess from previous context to next word, may yield a relatively insensitive measure of predictability.

III-A-6

TERRACE, H. S., "Effects of Retinal Locus and Attention on the Perception of Words", J. Exper. Psychol., (1959), 58:382-385.

Problem:

To test the presence of any differential recognition effects for tachistoscopically presented words and geometric stimuli to the right and the left of a central fixation point.

Method:

Subjects: Seventeen men and thirteen women, all college students who could read English fluently, were used.

Apparatus: A projection tachistoscope with an exposure of 100 msec was used. Another projector was used to illuminate the screen between exposures. A fixation point was on a screen 9 feet 10 inches from the subjects' eyes. A chin rest was used.

Procedure:

Forty words and forty unfamiliar nonsense forms were used. Twenty of each type appeared to the left and twenty to the right of the fixation point. The size and type of the stimulus was randomly varied. When words were used, the subjects wrote what they saw. When nonsense forms were used, the subject chose the best of three choices.

Findings:

Mean recognition scores were:
Words - right 16.92; left 12.16.
Forms - right 12.80; left 14.00.

Conclusion:

More words were recognized in the right visual field than the left. The recognition difference for the forms was not significant.

III-C-1

FRENCH, J. W., "Effect of Anxiety on Verbal and Mathematical Examination Scores", Educ. Psychol. Measmt., (1962), 22:553-563.

Purpose:

The primary purpose of this research was to learn about the emotional states aroused in students at the time of college entrance testing and to obtain estimates of the effect of these states on test scores and on the validity of the test.

Setting:

Subjects at sixteen high schools took the College Board SAT. They also took specified half hour test forms having material parallel to that in the regular operational parts of the SAT. The students were made to feel that the experimental tests were part of the regular tests.

The experimental non-operational sections of the SAT were referred to as Verbal A and Verbal B and Math A and B. A few days before the SAT for some students and a few days after it for others the students who took Verbal A with the SAT were given a special administration at their school of Verbal B and vice-versa, and students who took Math A with the SAT were given a special administration of Math B and vice-versa.

It was assumed that the students believed that the experimental tests given the SAT contributed to the score sent to the college of their choice. Thus anxiety was assumed to have been present. At the special administrations, "relaxed" conditions were set up. These tests were followed by a questionnaire asking about the student's background, academic ambitions, feelings of anxiety and reasons for feeling anxious. Two scales measuring generalized anxiety were included. Teachers' grades in four different high school subjects were collected.

The analysis of test validity was concurrent rather than predictive. It was the correlation of the tests with school grades. In order to estimate the actual amount in score points of the effect of anxiety on the test scores of different categories of candidates, it was necessary to use the experimental section which could be altered from one school to another for purposes of experiment. A simultaneous equations analysis was used to avoid the confounding of fatigue and practice with anxiety.

Results:

There were larger values than expected for the effect of practice. The range was from 11 to 17 points rather than the expected 10 points. None of the results for anxiety were significant, although for girls, the difference between the effect of anxiety on the verbal test and the effect on the mathematical test was significant at the .02 level. Anxiety was associated with a slight but significant improvement of girls' mathematical scores relative to their verbal scores. The comparison of scores on the relaxed tests with alternate forms taken with the college entrance test indicated no effect of anxiety for boys. The relaxed test, the "anxious" test taken with the SAT and the SAT itself were all found to have substantially the same concurrent validities. Therefore anxiety had no effect on predictive validity. On the questionnaire, girls who felt anxious showed up well on the mathematics test. However, for the other categories of students under observation, differences in the effect of anxiety were not consistent and not significant. All of them were below the standard error of measurement of the test.

Conclusions:

The effect of anxiety as defined in this study is small on the average, particularly when compared to the standard error of measurement in the SAT of about 30 points, and is not highly important in any obvious grouping of students.

HOLLAND, J. L., "Creative and Academic Performance Among Talented Adolescents", J. Educ. Psychol., (1961), 52:136-147.

Purpose:

This study was designed to determine and compare the characteristics of very creative students and outstanding academic achieving students.

Subjects:

A sample of 649 boys and 345 girls and their parents was drawn from the finalists of the National Merit Scholarship Competition. All of the students in the sample were high school juniors.

Procedure:

Students were asked to fill out: (1) The Gough Differential Reaction Schedule, (2) The Complexity-Simplicity, Independence of Judgment and Originality scales from the Inventory of Personal Philosophy, (3) The Mastery scale (derived from Stodtbeck's Value Scale), (4) The Deferred Gratification scale from the Merit Student Survey, (5) The Vocational Preference Inventory, (6) The Ghiselli Self-Description Inventory, (7) Self-rating on a four-point scale and a self-evaluation score based on the number of times a student rates himself above average on 20 traits, and (8) The Creative Activities scale--a list of hobbies and activities assumed to demand original behavior. Mothers filled out the Parental Attitude Research Instrument. Fathers gave information on family background and ranked nine goals and traits in the order in which they considered them valuable for their children to possess. The 75 predictors and criteria were then intercorrelated.

Findings:

(1) Creative students are more frequently independent, intellectual, expressive, asocial, consciously original, and have high aspirations for future achievement. Their fathers consider curiosity to be a valuable trait for their children.

(2) Academic achievers are usually persevering, sociable, responsible and popular. Their fathers place a high value on good grades and dependability.

(3) When the 20% of the creative students and the top 20% of the academic achievers were determined, there was a 4% overlap between the two groups.

Conclusions:

(1) Academic achievement involves somewhat different motives than creative performance; good grades in high school appear to be a function of socialization and perseverance, whereas creative performance is a function of conscious concern with high accomplishment, independence and originality.

(2) In a group of exceptionally bright students, intelligence has little or no relationship to creative performance in arts and science or to academic achievement.

KAROLCHUCK, Patricia A., and WORRELL, L., "Achievement Motivation and Learning", J. Abnorm. Soc. Psychol., (1956), 53:255-257.

Purpose:

The purpose of this study was to investigate the effects of need for achievement on directed and incidental learning. It was expected that a higher need for achievement group would manifest a greater degree of both directed and incidental learning.

Subjects:

One hundred and eight high school freshmen were subjects for the study.

Materials:

The learning task consisted of an adaptation of a James Thurber short story. A 20-item multiple choice test was used to measure learning.

Procedure:

The McClelland group TAT consisting of four pictures was administered to the subjects as a group. The TAT stories were scored by two judges and the 12 highest and 14 lowest in need for achievement were selected for study. The groups did not differ in terms of IQ, grade average, or reading ability.

The subjects were instructed to read the story and to look for spelling and grammatical errors and details of content. Each subject recorded his reading time. After reading the story, each subject completed the reading test.

Results:

1. There was no significant difference in performance of the high and low need for achievement groups on test items measuring directed learning (learning that is relevant to the induced set).
2. Subjects with high need for achievement scored significantly higher on items measuring incidental learning.

Conclusions:

High need for achievement individuals manifest more learning of an incidental nature than those with low need for achievement.

III-C-2

EDLING, V. J., "Utilizing Behavior Preferences in Mass Communications for
the Purpose of Modifying Attitudes", Ph.D. Thesis, University of
Nebraska, November, 1955.

Purpose:

To evaluate the role of behavior preferences in the process of changing specific social attitudes through a mass communication.

Method:

First, the behavior preferences of the subjects were ascertained. The object of the attitudes of the subjects was school property. Second, their existing attitudes toward the selected object were evaluated. Third, the subjects experienced a mass communication in which an attempt was made to associate selected behavior preferences with a desired change in attitude toward the psychological object. Fourth, an evaluation of attitudes toward the psychological object after the subjects had been exposed to a mass communication.

A control group was established to make sure that any modification of attitudes could be attributed to communication.

Of the experimental group, one-half received a communication which stressed peer status through responsible behavior, as opposed to cooperation.

Results:

In all instances the mean score on the post and final administrations of the attitude test for the groups possessing a strong behavior preference and receiving a message which was congruent with that behavior preference was higher than the mean score of the group with which it was compared.

Conclusions:

After experiencing a communication that is favorably related to a person's behavior preference he will become more favorable to a psychological object, than will a person who expresses less preference for the behavior.

The evidence suggests that it is the relative amount of the behavior preference possessed that is congruent with the message that determines its effects and not the amounts of an incongruent preference.

The direction of attitude change is toward increased congruity with existing psychological organization.

III-C-6

EDWARD, B., "A Study of Teaching Machine Response Modes in Lumsdaine, A. A., and Glaser, R., (eds.), Teaching Machines and Programmed Learning, Washington, D. C., National Education Association, (1960), 469-474.

Purpose:

This study was designed to answer the question: In a teaching machine situation, which mode of responding, multiple-choice or constructed (write in short answer), promotes more effective learning?

Subjects:

The subjects for the study were 200 ninth grade English speaking students.

Procedure:

The subjects were taught Spanish vocabulary using a teaching machine device which could be programmed to handle either multiple-choice or constructed items. Prior to training, all students were given one guidance trial in which the teacher read off the new Spanish word once and then its corresponding English word. Three conditions were used. In condition I the subjects worked to a criterion of mastery; i.e. each student worked until he had made two correct responses to each of the 16 items. In condition II subjects were given the same instructions as condition I groups, except that they were stopped at a set time prior to completion by the fastest student. Condition III was aimed at controlling both time and number of repetitions. Stimulus items were presented to both multiple-choice and constructed subjects at the same time. The subjects then marked their responses on answer sheets. The correct response was given immediately after the responses were recorded. A post-test (half multiple-choice and half constructed items) was given to all subjects immediately after the training. A delayed post-test was given two days later with previously tested constructed item words appearing in multiple-choice items and vice-versa.

Results:

1. Both immediate and delayed post-tests consistently favored the constructed response groups under all conditions. Generally speaking, a significant difference was found favoring response training groups under all conditions when constructed post-test items were compared.

2. Under condition I, the mean training time was significantly longer (.01 level) for the constructed group than for the multiple-choice group.

Conclusions:

1. If recall is the criterion for learning, then the teaching-machine situation which caused the student to construct his responses is training method superior to the teaching machine situation which causes the student merely to select responses, (multiple-choice), given conditions similar to those prevailing in this experiment. There is a possibility that multiple-choice items are more efficient if recognition is the only criterion for learning.

2. In working toward the mastery of items, the use of recall-type items in the teaching machine will require considerably more training than the multiple-choice type of teaching machine.

III-C-6

SILBERMAN, H. F., MELARAGNO, R. J., COULSON, J. E., and ESTAVAN, D., "Fixed Sequence Versus Branching Autoinstructional Methods", J. Educ. Psychol., (1961), 52:166-172.

Purpose:

The study compared two methods of branching: (1) a procedure allowing students to branch at their own option, and (2) a procedure where errors determined branching.

Procedure:

In Experiment I, fifty-one high school juniors were randomly assigned to three groups. Sixty-one multiple choice items on logic were placed on cards in a notebook. Group I received the items in a fixed sequence and could not turn back. Group II could review previous work. Group III received all items on one list and were instructed to study in any way they desired. In Experiment II, 36 senior high school and recent graduates were divided into two groups, a branching group and a fixed sequence group. The subjects were paired randomly. The branching group chose their own sequence of items. The fixed sequence group was matched randomly with the branching and received his partners sequence in a fixed order.

Results:

In Experiment I the branching group was superior to both the back branching and fixed sequence groups. The second two groups were similar in performance. In Experiment II there was no significant difference.

III-C-6

TALLENT, N., "Behavior Control and Intellectual Achievement of Secondary School Boys", J. Educ. Psychol., (1960), 47:490-503.

Purpose:

To study relationships between behavioral control in school and performance on a wide range of intelligence tests.

Procedure:

The subjects (80 ninth grade boys) were divided into two equal groups - an impulsive group and a controlled group - on the basis of ratings (by teachers and fellow students). Each subject was then given a battery of five intelligence tests consisting of (1) the Wechsler-Bellevue, (2) Porteus Mazes, (3) ACE Psychological Examination, (4) SRA Rimmary Mental Abilities and (5) A Culture Free Test.

Results:

1. There was a high relationship between intelligence scores and behavioral control ratings with the controlled students having the highest intelligence scores.
2. Impulsive boys tended to be superior on tasks of sensori-motor and coordination, while controlled boys were superior on tasks involving reasoning.

Conclusions:

1. Impulsive boys do not do as well on intelligence tests as controlled boys.
2. Controlled boys are at their best in areas demanding quantitative and abstract reasoning, while impulsive boys are at their best in activities requiring the use of their hands.

III-D-1

COWEN, E. L., WEINER, M., and HESS, Judith, "Generalization of Problem-Solving Rigidity", J. Consult. Psychol., (1953), 17:100-103.

Purpose:

The purpose of this study was to develop additional measures of problem-solving rigidity which are structurally similar to the water-jar technique and test the hypothesis that there will be a positive relationship between rigidity behaviors as measured by the several tasks.

Procedure:

Fifty-nine students were given the water-jar technique; then half were given an original alphabet maze and half an original motor maze. The criterion for eliminating a subject's records were either a wrong solution on the control problem, or mathematical or word errors on the test problem. With this criterion, 47 of the original 59 students were used.

Results:

The correlation between the two rigidity measures (water-jar and alphabet maze) was significant. The hypothesis of a positive relationship existing between measures of rigidity was substantiated. "A tendency towards a generalized mode or problem solution has been demonstrated, and the likelihood that this tendency is personality-related strengthened."

III-D-1

LEVY, N. M., and CUDDY, J. M., "Concept Learning in the Educationally Retarded Child of Normal Intelligence", J. Consult. Psychol., (1956), 20:445-448.

Purpose:

This study, part of a larger project undertaken to develop a "technique for predicting which children of normal intelligence, as measured by the usual methods, are likely to develop learning difficulties, "Represents an attempt to answer the following question: Given a group of children of normal intelligence, some of whom are underachievers in school, do underachievers differ significantly from normal achievers in ability to solve a concept formation problem?"

Assumption: Impairment in learning attributable to motivational and emotional difficulties can be measured by using a concept-formation problem.

Setting:

Subjects: Forty-six fourth grade elementary students were paired according to age, sex, and approximately for parental socioeconomic status. Their IQ's obtained from the California Test of Mental Maturity, ranged from 98 to 103. "One student of each pair was working up to grade placement while the other was behind from .5 to 2.5 years in achievement as measured by the Stanford Achievement Battery."

Criterion: The learning task was a variation of the oddity problem in which ten sets of Vigotsky Blocks were used. There were three wooden blocks in each set; the correct block was the odd one in terms of one of the three dimensions (size, color and shape). Three measures of learning were obtained from (1) number of errors, (2) number of trials to criterion, and (3) verbalization of the oddity principle.

Procedure:

Each subject was told to find the correct block in each set. If the correct block was not selected, subject was told, "That's not right.", the set was removed and a new set was presented. If subject selected the correct block, he received a chip which, at the end, was exchanged for a penny at the rate of five chips for one penny.

The ten sets were randomly presented each for a series of five times (a total of 50 selections or trials) until the subject made 11 consecutive correct selections in wnich case he received credit for correct selections on the remaining 50 trials. At the end, each subject was asked how he had solved the problem.

Findings:

Errors - 18 normal achievers made fewer errors than the paired underachievers.

Trials to Criterion - within the 50 trials, 11 subjects achieved 11 consecutive correct selections of which only one was an underachiever.

Correctly Verbalized Principle - 16 subjects (14 normal achievers and 2 underachievers) correctly verbalized the principle.

Ten subjects, all normal achievers, with both criteria and, using either criteria, there was a difference in favor of the normal achievers in 13 of the 23 pairs.

The non-parametric median test for discrepancy indicated a difference in favor of normal achievers in the degree of achievement between the normal achievers and the underachievers.

Conclusions:

It has been demonstrated that a difference in the rate of learning a concept exists and favors the normal achievers over the underachievers. Whether this difference is limited to the conceptual area or is more generalized remains to be dealt with as well as whether potential underachievers can be detected in pre-school or the first grade - these questions were under a study at the time of publication of this article.

III-D-1

PALERMO, D. S., CASTENEDA, A., and McCANDLESS, B. R., "The Relationship of Anxiety in Children to Performance in a Complete Learning Task", Child Development, (1956), 27:333-337.

Purpose:

To investigate the theoretical implication that "the performance of anxious (high motivation) children would be inferior to that of non-anxious (low motivation) children in a learning situation which involved the presence of completing incorrect responses."

Subjects:

A group of 36 fourth grade subjects were chosen on the basis of extreme scores made on a test of manifest anxiety (Taylor Scale). The 18 subjects with the highest scores were considered the anxious group and the 18 subjects with the lowest scores were the non-anxious group.

Apparatus:

The apparatus consisted of a box 13 x 12½ x 5½" painted flat black. A sloping response panel (7½ x 9½ x 13") projected from its base. Two pushbuttons and a green jeweled reflector were arranged on this panel. Housed behind the aperature were four colored lights: red, blue, amber, and white. The construction was such that by means of a rotary selector switch any single light could be activated and by means of a toggle switch either one of the two buttons could be set to turn it off. If the correct button was selected, the light went off and the green light on the response panel was activated. In correct responses neither the stimulus light nor the green light on the response panel was affected.

Procedure:

All subjects were given 20 trials. The order of appearing lights was random and no single light appeared twice in succession. Each light remained on until the subject made the correct response. Two of the lights were turned out by one button and two were turned out by the other button. The subject was instructed to learn which button turned off each light.

Results:

The learning curves indicated the non-anxious subjects were superior to the anxious subjects. Analysis of variance showed that over-all differences between the errors made by the anxious and non-anxious groups was significant.

Conclusion:

The study suggests that children's anxiety scale is a useful measure of motivational level. Specific attention should be given to the performance of anxious and non-anxious subjects in situations where the strength of the correct and incorrect responses may be determined. It was expected that difficult discriminations would be easier for the non-anxious than for the anxious. "In the area of verbal learning it might be expected that a list of words of high association value and low intralist similarity would be easier for anxious subjects than for non-anxious subjects."

III-D-1

REESE, H. W., "Manifest Anxiety and Achievement Test Performance", J. Educ. Psychol., (1961), 52:132-135.

Purpose:

This study was designed to investigate the relationships among manifest anxiety, intelligence and performance to test the hypothesis that there is an inverse relationship between manifest anxiety and performance on simple arithmetic (speed test).

Subjects:

Subjects were 539 fourth and sixth grade school children.

Procedure:

The subjects were given the Children's Manifest Anxiety Scale (CMAS) and one week later an arithmetic test consisting of 40 addition problems. The arithmetic test had a 13-minute time limit. Both tests were administered by the teachers to their regular classes, using standard instructions. Scores on the Primary Mental Abilities Test were obtained from school records.

Findings:

(1) Manifest anxiety was negatively correlated with the number of correct answers on the achievement test, though the correlation was not significant for fourth grade males.

(2) When the subjects were divided into six subgroups on the basis of CMAS scores and their achievement test scores compared by an F test the effect of anxiety was significant at the .001 level. This effect was not significantly related to grade or sex.

(3) Manifest anxiety was more strongly correlated with achievement test scores than with IQ.

(4) The multiple correlations for predicting performance from anxiety and IQ were about .04 higher than the correlations for IQ alone and the combination of anxiety and lie score with IQ improved the correlation by .07.

(5) Partialing out IQ had little effect on the correlations between manifest anxiety and achievement.

Conclusion:

The relationship between anxiety and achievement is negative and linear, but manifest anxiety had relatively little effect on scores on an achievement test of the type used in this study.

Discussion:

The relationship between anxiety and achievement test performance is statistically significant but is not a strong relationship.

ZWEIBELSON, I., "Test Anxiety and Intelligence Test Performance", J. Consult. Psychol., (1956), 20:479-481.

Purpose:

To investigate the relation between children's test anxiety and the scores they received on mental ability group tests which differed in content, format, and method of administration.

Procedure:

A 43 item questionnaire dealing with these anxiety statements was presented orally to twelve groups of subjects. Three measures of mental ability were obtained from the administration of the Otis-Alpha, the Davis-Eells, and the Otis-Beta.

Findings:

Using the Hotelling formula which takes into account the correlations between the tests, no significant difference was found between the correlations of test anxiety vs. Otis-Beta and test anxiety vs. Davis-Eells, although the difference was in the predicted direction. At the five percent level, the difference between the correlations of test anxiety vs. Otis-Alpha and test anxiety vs. Davis-Eells was found to be significant.

Using the upper and lower thirty-one percent as high and low anxious groups, the low anxious group made higher mental ability scores regardless of the instrument used and regardless of the order of administration.

Conclusion:

The position that test anxiety may be related to and affects mental ability test results has been supported by this study. "There is also some support for the Davis and Eells contention that their test is less influenced by anxiety than other conventional tests."

III-D-3

DAVIDSON, H. H., and BALDUCCI, D., "Class and Sex Differences in Verbal Facility of Very Bright Children", J. Educ. Psychol., (1956), 47: 476-480.

Purpose:

This study was designed to investigate the mutual influence of sex and class status on verbal facility, and to determine if the verbal ability of bright children, from desperate economic backgrounds, is conditioned by social class and whether it is boys or girls who are affected more by class position.

Subjects:

The subjects were ten boys and ten girls of low social status, and ten boys and ten girls of high social status. Ages ranged from nine years to fourteen years and their Stanford-Binet IQ's ranged from 120 to 157, with an average IQ of 143 for boys and 135 for girls. Family income was the basis of determining social class.

Procedure:

Verbal facility was measured in three ways using responses given to cards I, III, VI and X of the Rorshach test: (1) the total number of words used in the initial response, (2) the number of uncommon words, and (3) the number of adjectives and adverbs. Product-moment correlations were computed among the measures and analysis of variance was applied.

Findings:

The evidence indicates that there were no significant differences between the sexes or between the classes for any of these measures. Also, the interaction between sex and class was not significant.

Although the results were not statistically significant, the mean of the three measures revealed a consistent trend with the boys superior in all measures. The boys are superior in all measures and retain their superiority in all social classes, and when sex is disregarded, the high social class children were also superior.

No conclusions were drawn.

Discussion:

The finding that boys are superior to girls is contrary to other findings and is explained by the fact that the boys were superior in IQ. Although very bright children seem able to overcome, to some extent, the handicaps in language ability resulting from their underprivileged environments, apparently they do not acquire the same facility with difficult and unusual words that their more fortunate peers have obtained.

III-D-3

ESTES, Betsy W., "Influence of Socioeconomic Status on Wechsler Intelligence Scale for Children: An Exploratory Study", J. Consult. Psychol., (1953), 17:58-62.

Purpose:

To determine whether socioeconomic level has an influence upon the WISC item responses.

Setting:

Forty subjects were used whose fathers were physicians, lawyers, etc. Forty subjects were also used whose fathers were common laborers. Half the subjects were male, half were seven years plus or minus 2 months, half 10 years plus or minus 2 months, half second graders, and half fifth graders.

Measures used were the WISC and Metropolitan Achievement Tests.

Findings:

Scores on the WISC vary with socioeconomic level; the upper economic group was superior to the lower.

When the groups were divided by age (or grade) the differences were significant at the second grade level but not at the fifth.

Using achievement as the criterion, the WISC did not predict better for one economic group than for the other.

III-D-4

BOWMAN, H. L., "The Relation of Reported Preference to Performance in Problem Solving", J. Educ. Psychol., (1932), 23:266-276.

Purpose:

This study was concerned with determining the relationship between reported preference for a subject and actual performance in that subject. Specifically the problem was:

(1) Are pupils more successful in performing problems for which they express a preference?

(2) Of what significance is this relationship of reported preference to performance with respect to:

(a) nature and types of problems used?
(b) intelligence and ability of pupils?

Procedure:

Fifty mathematical problems, consisting of two test forms of 25 problems each made up the items of the research test. Each form consisted of 6 pages. Page 1 contained instructions and pupil data, while the remaining 5 pages consisted of 5 problems each. One each of 5 different types of problems was placed on each page, and the various types were rotated so that none occupied the same location on any two pages. At the bottom of each page beneath thr problem was the following incomplete sentence: "The problem on this page I like best is number ______." All problems were near equal in difficulty so as not to influence preference. This test was then administered to 546 junior high school students. After the tests were scored, the 5 types were ranked according to frequence of preference. They were then assigned a value equal to their rank standing. By multiplying the number of each response or preference by the assigned value, a preference score was obtained. These scores were then correlated with the performance scores.

Results:

When the preference scores were correlated with the total performance scores, a coefficient of .46 was obtained. When the total group scores of performance and preference were correlated, a coefficient of .58 was obtained.

Conclusions:

(1) Reported preference within a narrow field can be measured, and correlates positively with performance, but not enough to predict performance from preference.

(2) The relation between performance and preference are significant enough that they should be considered in textbook problems.

(3) Both preference and performance vary with intelligence level of students.

(4) Experiences in the past have an influence on problem preference, and problem type is not an inherent or a permanent quality.

III-D-6

CARTER, H. D., "The Effects of Emotional Factors Upon Recall", J. of Psychol., (1935-36), 1:49-59.

Purpose:

To study differences in the learning of pleasant, indifferent and unpleasant words.

Procedure:

One hundred sixth and seventh graders were tested on five equally spaced occasions lasting over a period of two years. Single words were used in the first three tests. Groups of pleasant (P), indifferent (I), and unpleasant (U) words were obtained using a rating of 1-5. In the last two series of tests, combinations of words were used (each consisted of a noun and an adjective). The children recalled the appropriate word or words in response to a picture. Pictures associated with particular words were rotated for different subjects. Learning scores for each person were obtained from each word separately. Composite scores for learning (P) words, (I) words and (U) words was computed for each subject.

Results:

Children learned the pleasant words best, the unpleasant next, and the indifferent poorest. The differences became larger and were more reliable when the amount of data was increased.

Conclusion:

The use of a large list of adequately selected words, the careful rotational procedures used, and the trends noted in the cumulated data have established the probability that the trends are brought about by the emotional tone of the words, or by other factors functionally associated with emotional factors.

III-D-6

CARTER, H. D., "Emotional Factors in Verbal Learning: IV Evidence from Reaction Time", J. Educ. Psychol., (1937), 28:101-108.

Purpose:

This study was conducted to determine the effect of emotion as a factor in learning, putting the emphasis not on intensity of emotion, but quality of emotional tone.

Method:

Free associations tests were given to a group of 100 children in Oakland, California. An equal number of pleasant, unpleasant and indifferent words were given. The children were told to reply to the first word that came to their mind. Association times were recorded with a stop watch.

Results:

The association times were reliably longer for the unpleasant words than for the words in the other two categories. There was no reliable difference in association time between the pleasant and indifferent words used in the study.

Conclusions:

Association times are greater for unpleasant words, and no difference is apparent between pleasant and indifferent words. Association times are known to be longer for difficult or unfamiliar words. The data is consistent with the theory that emotionally-toned material is easier to learn than indifferent material and that unpleasant emotional responses contain elements which tend to inhibit learning.

III-D-6

FLORANO, G., and AXELROD, H. C., "The Effect of Repeated Praise or Blame on the Performance of Introverts and Extroverts", J. Educ. Psychol., (1937), 28:92-100.

Purpose:

The purpose of this investigation was to determine experimentally the effects of repeated praise or blame on the performances of children, who, on the basis of their responses to a psychological questionnaire, were classified as extroverts or introverts.

Method:

Four classes in the fifth grade of a public school in New York City were selected as subjects for the experiment. All students were given an extroversion inventory devised by Pintner. On the basis of their total scores, the children in each grade were divided into two groups; those above the mean in the extrovert group (E) and those below in the introvert group (I).

Procedure:

The above groups were further divided into four groups: The EP group (extrovert praise), EB (extrovert blame), IP (introvert praise) and IB (introvert blame). The entire class was then administered a cancellation test. The students then took their papers to the teacher who graded them either with a P (poor) or a G (good). The students then returned to their desks, placed their papers face down and the teacher announced the P stood for poor and the G was for good. This way each child received individual praise or blame, and group praise or blame. A second test was then immediately administered. Again each child was given a score of P or G (same score as before) and returned to his desk. A third form of the cancellation test was then given in order to measure the effect of the repeated incentives. At the end of the third testing period, the papers were immediately collected without being marked. All tests were then scored, and the results were compared.

Results:

The results of the first trial showed the means of all groups within 2 points. The comparison on the next two trials with the first were shown in improvement only, not total score. After the first incentives, the IB group gained the most, with EB making the second greatest increase. For trial three, the EB group made the greatest improvement with the IB having the second highest mean score, but not the second highest improvement. The IP group made the second largest improvement on the third trial. The results reveal consistently greater gains for the B (blame) group throughout. The P (praise) however begins to show its influence on the third trial. The introverts responded more readily to blame after the first application, but when the blame is intensified, the extroverts produce the larger gain in performance. It is interesting to note that praise has the reverse effect. Extroverts are more responsive to one application of praise than the introverts. With the second application of praise the introverts slightly surpass the performance of the extroverts.

Conclusions:

Blame as a form of motivation is in general more effective than praise or indifference. Introverts who were blamed made a statistically significant increase over the performance of the control group after both the first and second application of blame, whereas the extroverts had to be blamed twice before their increase over the performance of the control group was statistically significant.

In general, praise apparently did not exercise any differentiating effect. The mere repetition of the test produced a marked improvement of the performance in the control group.

III-D-6

SHAY, C. B., "Relationship of Intelligence to Step Size on a Teaching Machine Program", J. Educ. Psychol., (1961), 52, 2:98.

Purpose:

To examine the relationship between intelligence and size of item step on a teaching machine program under the criterion conditions of total learning, learning involving rote materials, learning of materials involving understanding, errors and time to complete the program.

Subjects:

Ninety fourth grade students were chosen on the basis of roman numeral pretest and group intelligence test scores.

Procedure:

Three programmed teaching sequences of 103, 150 and 199 times were developed, each sequence written for a given level of ability and having a step size adjusted to meet a stated criterion.

Nine experimental groups were identified, three groups from each of three ability levels.

Each subject completed 50 items a day until he finished his program. A post-test was then given. Performance measures obtained for each subject included: old and new items, post-test and total post-test scores, total errors, and time necessary to complete the program.

Findings:

The hypothesis that there is no relation between intelligence and size of item step was rejected only in the case of percentage error, where an interaction was found ($p < .05$).

With the definition of step size as "the difficulty of giving the correct answer", the study indicated that if there is a relationship between intelligence and step size, it is not a strong one.

III-E-1

FRENCH, Elizabeth G., "The Interaction of Achievement Motivation and Ability in Problem Solving Success", J. Abnorm. Soc. Psychol., (1958), 57:306-309.

Purpose:

This investigation was designed to test the hypothesis that performance in a problem solving situation will be related to ability level among subjects with high achievement motivation, but there will be little or no relationship among subjects with low achievement motivation.

Subjects:

The subjects were 96 airmen undergoing basic training. They were selected to cover the Armed Forces Qualifications Test (AFQT) range with equal numbers in the 70-79, 80-89, 90-99 categories. They were also selected so that equal numbers of each quartile fell in each AFQT category. This resulted in a 3 x 4 design with three levels of ability and four levels of achievement motivation.

Apparatus:

The problem solving apparatus consisted of a panel of lights on which the subject was required to create specific designs.

Procedure:

At the beginning of the session each subject was given the Test of In sight (TI) which was used as a measure of achievement motivation. The TI consists of descriptions of the behavior of hypothetical individuals and the subject is asked to explain the behavior. The number of achievement relevent explanations make up the score.

After the subject had taken the test he was shown the apparatus and given a practice period. He was then instructed to work the 16 problems by working them first in his head and then placing the correct solution on the panel. He was instructed to keep working on a problem until he found the correct solution. Each subject was given 25 minutes to work the 16 problems. It was not expected that anyone would complete all of the problems.

Results:

1. The subjects who scored above the median on the motivation scored significantly higher (.01 level) on the problem solving task than those who scored below the median on the motivation tests. The correlations between AFQT and performance were .60 for the high motivation group and .08 for the low motivation group.

2. Subjects with high motivation solve more problems than subjects with low motivation (when ability is held constant).

III-E-1

FRENCH, Elizabeth G., and THOMAS, F. H., "The Relation of Achievement Motivation to Problem-Solving Effectiveness", J. Abnorm. and Soc. Psychol., (1958), 56:45-48.

Purpose:

This investigation was designed to test the hypothesis that performance in a problem solving situation will be related to ability level among subjects with high achievement motivation, but there will be little or no relationship among subjects with low achievement motivation.

Subjects:

The subjects were 96 airmen undergoing basic training. They were selected to cover the Armed Forces Qualifications Test (AFQT) range with equal numbers in the 70-79, 80-89, 90-99 categories. They were also selected so that equal numbers of each quartile fell in each AFQT category. This resulted in a 3 x 4 design with three levels of ability and four levels of achievement motivation.

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2. Subjects with high motivation solve more problems than subjects with low motivation (when ability is held constant).

III-E-1 also III-E-2

GLANZER, M., and GLAUR, R., "A Study of Non-Intellectual Correlates of Trouble-Shooting Ability: Rigidity Measures", Tech. Report, ASTIA, Doc. #AD204511.

Purpose:

"On the basis of previous work and hypotheses concerning rigidity, a battery of 13 rigidity tests and a set of criterion measures of trouble-shooting performance were constructed. The rigidity tests were defined in terms of four major categories.

1. Ability to change performance sets.
2. Ability to change perceptual sets of restructured perceptual presentation.
3. Preference for highly structured, simplified stimuli.
4. General attitudes concerning organization of the individual's world and arrangement of life activities."

In addition, other predictors referred to as auxiliary measures were used.

1. Aptitude measures.
2. School grades.

Subjects:

During the 12th to 20th week of training in the School of Tactical Communication Equipment at Scott Air Force Base, a total of 251 subjects were given the rigidity tests.

For Criterion Tests: From the group of 251 subjects given the rigidity tests, 152 were given the criterion tests during the 17th to 20th week of training. (The 17th week was selected because that time the subjects all had received training on the equipment involved.)

Criteria:

"The criterion measures consisted of two types of problems.

1. Routine problems in which the combination of malfunction and symptoms readily evoke the appropriate corrective procedures.
2. Novel problems in which new procedures must be formulated and standard procedures must be rejected.

Two alternate forms of the criterion test were constructed. Each form consisted of six items, three novel and three routine."

Procedure:

Rigidity test battery: By order of administration and with time required indicated:

| Test | Time in Minutes |
|---|---|
| Hidden figures | 15 |
| Computations | 26 |
| Comparisons | 13 |
| Closure | 27 |
| (Break) | (10) |
| Design preference | 13 |
| Word path | 33 |
| Silhouettes | 14 |
| (Break) | (10) |
| Perservation, rigidity dogmatism and work scale | 19 |
| Figure names | 15 |
| Anagrams | 10 |

The total amount of time used was 205 minutes.

The test situation was counter-balanced by design and subjects were randomly assigned to these conditions. Six subjects were tested during each four-hour session and there was a 30 minute time limit on each problem. "The troubles were inserted into each of the six pieces of equipment prior to the testing session." Subjects were each given the trouble symptom on a card and a hint card was given after 10 minutes and after 20 minutes, with the administrator recording "the point in solution procedure at which the hint was given." Solutions were indicated by writing the name of the defective part on a card; subject was then given the replacement part and told if solution was correct and if not correct, subject continued until reaching either a correct solution or the 30-minute time limit. "The subject's score consisted of the number of novel and number of routine problems solved within the allotted time."

Findings:

"The main findings of the study on the basis of the intercorrelations between rigidity tests, auxiliary measures and criterion tests may be summarized as follows:

1. The results indicate low relationships between the rigidity measures and both the novel and routine criterion measures.
2. There is no differential pattern of relationships between the rigidity tests and novel trouble-shooting performance as compared with performance on routine problems.
3. The rigidity tests display consistency among themselves. In particular, measuring a general aspect of rigidity.
4. Combination of aptitude test scores and rigidity test scores showed some evidence of improved prediction of school performance above the relationship found with aptitude scores alone. The improvement was, however, slight.

KOTT, M. G., "Learning and Retention of Words of Sexual and Nonsexual Meaning", J. Abnorm. Soc. Psychol., (1955), 378-382.

Purpose:

(1) To see if associates to sexual words will be learned and retained less efficiently than associates of neutral and unpleasant words.

(2) To see if anxious subjects will show a greater relative difficulty in learning and retaining associates to sexual words as compared with associates of neutral and unpleasant words than will normal subjects.

Procedure:

Sixty normal subjects and sixty hospitalized anxious subjects were required to learn paired word nonsense syllables to a criterion. Three lists of nonsense syllables were associated with words being either sexual, unpleasant but non-sexual, or neutral.

Results:

Learning, recall, and relearning scores were treated by analysis of variance and covariance. No overall significant difference was found between groups or among lists. Consequently Purpose #1 was not confirmed.

The anxious group was more efficient in learning and retention of associates to sexual words than associates to neutral and unpleasant words, while the normal group was less efficient in learning and retention of associates to sexual words than associates to neutral and unpleasant words.

Conclusion:

Learning and retention are not significantly affected by repression.

III-E-1

MATARAZZO, R. G., "The Relationship of Manifest Ansiety to Wechsler-Bellevue Subtest Performance", J. Consult. Psychol., (1955), 19:218.

Purpose:

The purpose was to examine the validity of the diagnostic signs (subtests patterns) of anxiety as described by Wechsler, Rapaport, Gill and Schafer.

Procedure:

Eighty male medical and psychiatry patients were given the Wechsler-Bellevue and the Taylor Scale to assess anxiety level. From the Taylor raw scores, five anxiety groups were determined.

Results:

The F Test indicated no relationship existed between anxiety level and subtest performance. The subtest being in this case low digit span and object assembly scores. Neither range nor deviation from the mean was found to be related to level of anxiety.

These results indicate that the diagnostic signs described by Wechsler, Rapaport and others should perhaps be questioned as to their validity. In view of clinicians' long standing belief that some digit span and object assembly are influenced by anxiety, this study demonstrates surprising results.

III-E-1

SPERBER, Z., "Test Anxiety and Performance Under Stress", J. Consult. Psychol., (1961), 25:225-233.

Purpose:

This study was to determine the relationship of high and low amounts of stress on high and low anxiety subjects.

Procedure:

U. S. Air Force Recruits at Sampson Air Force Base were used as subjects for this study. The recruits were divided into two groups, a high and a low stress group. The recruits were all initially told that advancement would be determined by the results of their tests. All were given the same test the first day. On the second day, the high stress group was told they had failed the previous day, while low stress students were told they were successful. The second day the high anxiety subjects still believed the results determined advancement, but low anxiety subjects were told to just do their best.

Results:

The high anxiety group performed best under conditions of high stress. Under conditions of high stress, the high anxiety group out-performed the low anxiety group. Under conditions of low stress, just the opposite was true, the low anxiety group was superior to the high anxiety group.

TAYLOR, Janet A., and CHAPMAN, Jean P., "Anxiety and the Learning of Paired-Associates", Amer. J. Psychol., (1955), 68:671.

Purpose:

This study was designed to test the hypothesis that high anxious subjects should perform at a higher level than low anxious subjects in a verbal learning situation.

Subjects:

The subjects for the study consisted of two groups of 17 subjects who scored extremely high or extremely low on the Manifest Anxiety Scale (no further description was given).

Procedure:

Criterion groups were tested on two verbal lists, each consisting of eight pairs of nonsense syllables in which formal intralist similarity was low. In such low similarity lists few interfering tendencies were presumed to be present (each stimulus tending to elect only its own responses).

Findings:

The anxious group was superior to the nonanxious on each list both in terms of errors and in terms of trials to the criterion. The difference between groups was significant at the 5% level or beyond.

Conclusions:

The superiority of performance of anxious subjects is not confined exclusively to nonverbal situations.

EWING, T. N., "A Study of Certain Factors Involved in Changes of Opinion", J. Soc. Psychol., (1942), 16:63-88.

Purpose:

To investigate the relation between subject and the propagandist as it influences change of opinion.

Procedure:

Six Thurstone-type opinion scales were given three times to 150 subjects. At the first presentation the subjects were told that this was a survey of opinions. At the second presentation, written propaganda was given ranging from one-third to two-thirds of a page dealing with four of the six scales. Group A was told that the material was taken from reliable sources, Group B was told nothing about the reliability of the sources, but was told to find passages in the material they could agree with, and disregard the rest in making their judgments. Group C was merely asked to read the material and consider it in their judgment. After reading the material the subjects indicated their opinion on the scale. Then each subject checked words in a list which he believed characterized the material.

( ) biased
( ) unbiased
( ) logical
( ) not logical
( ) opposed to my experience and observations
( ) in agreement with my experience
( ) of doubtful authenticity
( ) authoritative

Following this, the subject was asked to check the point in the scale which he believed a person who believed wholly and completely in the propaganda would check. This is referred to as "propagandist's opinion". He also indicated whether he had little, some, or considerable interest and information concerning the subject of the scale.

A week later the third presentation was the same as the first.

Results:

It was indicated that the greater the distance between subjects and propagandist's opinion, the greater the change in opinion tended to be. This tendency was enhanced where reports of the characteristics of the propaganda were favorable, where intent of propaganda and bias of subject were in some direction and where the original change of opinion was positive. It was also indicated that where difference between propagandist's and subject's opinion was small, there was usually a negative change (away from propaganda) in the subject's opinion. The judgments of the characteristics of the propaganda material depended on the degree of opposition of the bias of the subject and intent of the propagandist. Where bias of subject and intent of propagandist were in the same direction, change of opinion was facilitated. This sameness of bias and intent seemed to be the major relation between subject and propagandist which facilitated change of opinion.

Other relations found were that a report of considerable interest and information were negatively related to change of opinion. Favorable characteristics of the propaganda such as (unbiased, logical) were positively related to opinion change. Originally negative changes were found to persuade subjects to a greater degree than originally positive changes.

III-E-3

HANES, B., "Perceptual Learning and Age", J. Consult. Psychol., (1953), 17:222-224.

Purpose:

This study was designed to test the following hypotheses:

1. That highly stable, unambiguous information will be relatively intact in later maturity.

2. That materials which call for new associations will show an intermediate decline in later maturity.

3. That information which is contrary to past experience will show the greatest decline in later maturity.

Setting:

Subjects: One hundred and eighty male non-psychotics who had normal scores on the Minnesota Multiphasic Personality Inventory and who were "recent arrivals at the Ohio State Penitentary..." served as subjects. Each subject was told, individually, that "...they composed a part of a special group of high caliber men, and that we wished to compare them on a test with other inmates." "The subjects all agreed they would do their best on the test, in fact, they were quite anxious to get started."

The perceptual learning task consisted of three types of material presented tachistoscopically. Type A was essentially material agreeing with past experience or highly stable, unambiguous, true material, e.g., 10 x 7 = 70, 23 - 7 = 16, 16 x 3 = 48. Type B was essentially material contrary to past experience of false, nonstable material requiring a reversal of past associations, e. g., 20 x 4 = 10, 9 x 12 = 90, 18 - 9 = 11; and Type C was essentially new nonsense requiring associations that were new, e.g., 14 : 3 = 12, 21 : 17 = 9, 5 : 15 = 62.

Chronological age was the criterion of the aging process and was as follows: Group I - "Young Group" - subjects from 20-35 years of age; Group II "Middle Maturity Group" - subjects from 35 to 49 years of age, and Group III "Later Maturity Group" - or "Old Group" - subjects from 50 to 70 years of age. Each group contained 60 subjects "of approximately average intelligence and of normal visual acuity." Group I was utilized as a control group.

Procedure:

Thirty tachistoscopic exposures of five inch white index cards containing various types of information were randomly presented for 1/10 second. Subjects were individually tested, having been given several practice cards to familiarize them with the operation. The score was the number of correct perceptions.

Findings:

Analysis of variances indicated a real difference existed between types of material exposed and between the subjects within each age group. The non-significant t ratio on Type C material probably indicated an interaction between Groups II and III. "...the largest deviation of materials A and B from the general trend occurs in the middle age group and grows imperceptibly less as the extreme ages are approached."

Conclusions:

Materials which require a reorganization or reversal of old associations produce a substantially greater deficit in the aged, however, the greatest deficit is produced by materials which require the learning of new associations.

No relationship was found between kinds of material and age, however, there was a consistent relationship found between age and performance. Thus, the investigators concluded, "The younger person performs better but experiences approximately the same difficulty with various types of material as the older person."

BARDACH, J. L., "Effects of Situational Anxiety at Different Stages of Practice", J. Exper. Psychol., (1960), 59:420-424.

Purpose:

To investigate the hypothesis, based on the view of anxiety being a drive, that situational anxiety induced early in practice will have a more unfavorable effect upon performance than anxiety induced late in practice.

Procedure:

The learning material was a list of 10 low association value nonsense syllables presented for two seconds with an inter-trial interval of 20 seconds.

Subjects were asked to anticipate each syllable by spelling it and to learn the list of criterion of two consecutive errorless trials.

There were two experimental groups and two control groups. The first experimental group received a shock after learning 30% of the list. The second experimental group received a shock after learning 70% of the list. Although the subjects received only one shock during the experiment, the instructions indicated several shocks could be expected.

Results and Conclusions:

Contrary to that expected in the hypothesis, the results indicated that the late rather than early introduction of anxiety produced more unfavorable effects on performance. The attitudes resulting from the situational anxiety appeared to be the main determinant of effects, i.e., compatible attitudes appeared to facilitate performance while incompatible attitudes hindered performance regardless of when situational anxiety was introduced.

HAKE, H. W., and ERIKSEN, C. W., "Effect of Number of Permissible Response Categories on Learning a Constant Number of Visual Stimuli", J. Exper. Psychol., (1955), 50:161-167.

Purpose:

1. To determine the effect upon performance of the number of labels used in identifying the patterns during the original learning task.
2. To determine the effect of the above variable upon performance during the transfer task.

Setting:

Ninety individuals were used. Each of 16 patterns appeared on a 5 x 5 matrix of 25 neon bulbs. The appearances were spaced 10 seconds apart and lasted two seconds.

Procedure:

Each saw the 16 patterns 20 times. The task was to learn which label from his list could be applied correctly. Immediately after each response, the subjects were told the correct label.

Each individual had two tasks:
(1) Original learning task.
(2) Transfer task with a different set of labels.

Results:

(1) Those who did well in the learning task did well in the second task.

(2) Differences among the possibilities of chance successes associated with number of labels used in the learning task account for the performance in that task.

(3) The performance in the transfer task was greatly affected by the number of labels used in the task and not the ones in the learning task.

III-E-6

JAMES, N. E., "Personal Preference for Method as a Factor in Learning", J. Educ. Psychol., (1962), 53:43-47.

Purpose:
This study was designed to determine if individuals who are given learning material by a mode of their preference actually learn better than those individuals who are given the material in a mode unlike their choice.

Sample:
Subjects were 368 basic airmen at Lackland Air Force Base, Texas.

Method:
A pretest of aviation information was administered. Following the pretest and a brief explanation of the study, the subjects were asked to indicate which of two modes of presenting technical learning material they preferred. The choices offered were: (a) reading presentation (b) lecture presentation (c) no preference. Each group was then subdivided randomly, one segment being given learning material utilizing the mode of choice with the other segment utilizing a different mode. Immediately following each presentation the groups were tested with a multiple-choice test. AFQT scores were available for each subject.

Results:
The analysis of variance applied to the data revealed no statistically significant differences between the experimental groups except those due to differences in AFQT scores. The learning of the groups that received the material in the preferred mode was not significantly different from the groups that received the material in a mode unlike that chosen nor was it significantly different from the groups that expressed no preference.

III-E-6

JASPER, N., "Effects on Training of Experimental Film Variables, Study I: Verbalization, Rate of Development, Nomenclature, Errors, 'How It Works', Repetition", Pennsylvania State University Instructional Film Research Program, Port Washington, New York, U. S. Naval Training Devices Center, Office of Naval Research, Technical Report No. SDC 269-7-17, Oct. (1950).

Purpose:

To study the relative effects on learning of certain characteristics of instructional films.

Procedure:

Seventeen versions of a training film on block assembly were developed varying the following characteristics: (1) amount of narration, (2) rate of development, (3) nomenclature, (4) pointing out of common errors, (4) descriptions of how it works, and (6) repetition. The films were shown to groups of navy recruits who were required to assemble the breechblock. The average assembly time was used as the measure of learning.

Results:

1. Of the variable studied, clear-cut, positive results were found for: a slow rate of development, the showing of common errors, and repetition.

2. Findings for the other variables tended to be negative and inconclusive.

Conclusions:

1. A slow rate of development is the most important factor in making a teaching film effective.

2. Repetition of the demonstration of a task and pointing out common errors add to the effectiveness of the film.

JASPER, N., "Effects on Training of Experimental Film Variables Study II: Verbalization, 'How it Works', Nomenclature, Audience Participation and Succinct Treatment", Pennsylvania State University Instructional Film Research Program, Port Washington, New York, U. S. Naval Training Devices Center, Office of Naval Research, Techincal Report No. SDC 269-7-11, March, (1950).

Purpose:

To evaluate the effects on learning of: (1) certain characteristics of films designed to teach an assembly task and (2) audience participation as a film utilization technique.

Procedure:

Fourteen versions of a film on the assembly of the breechblock were used to investigate the following characteristics: (1) level of verbalization, (2) sequence on (3) audience participation, (4) succinct treatment, and (5) nomenclature. Thirty-three companies of Navy recruits were used to evaluate the effectiveness of the film versions. Learning was measured by timed assembly of the breech.

Results:

1. A significant difference was found between medium and very low levels of verbalization, but not between medium and high or medium and low levels.
2. "How it works" films were not significantly superior to comparison films.
3. Audience participation aided learning when the film had a slow rate of development, but hindered learning with a fast rate of development.
4. The succinct film version was inferior to longer versions.
5. The use of Technical nomenclature does not teach it.

Conclusions:

1. A medium level of verbalization is best in an instructional film.
2. Audience participation aids learning if the rate of development is not too fast.

KIMBLE, G. A., "The Effect of Praise, Reproof and No Incentive on the Value of a Training Film", Air Force Personnel and Training Research Center, Training Aids Research Laboratory, Unpublished Laboratory Note (mimeo), TARL-LN-55-7, December 1955 (a), Symposium on Programmed Instruction, (1961), 512-514.

Purpose:.

This study was designed to compare the effects of praise, reproof and no incentive conditions upon learning.

Subjects:

The subjects for the study were Air Force Basic Trainees, who were assigned to various experimental conditions.

Procedure:

A 2 x 2 x 3 experimental design was used, varying (1) ability (high vs. low AFQT scores), (2) participation conditions (guided vs. unguided) and (3) incentive conditions (praise, reproof or no incentive). The learning session consisted of two films. The first was on how to read the slide rule and the second on how to use it to multiply and divide. Each film showing group (or audience) consisted of four quarter-flights who were instructed and treated as a single group. On the basis of AFQT scores they were manipulated in a manner which resulted in two groups with relatively high AFQT scores (mean 65.7) and two groups with relatively low AFQT scores (mean 55.3). For each incentive condition this yielded 383 Ss comprising four independent replications, paired on AFQT status and participation condition. A test on reading the slide rule (25 items) was interpolated between the two films, followed immediately by the incentive treatments, which consisted of a brief statement given by a specially trained non-commissioned officer after observing the trainees performance as they were taking the slide rule reading test. For the praise condition, he told the trainees that most of them seemed to be doing well and that their performance was "very gratifying." For the reproof condition, he gave the same message with such substitutions as doing poorly. Nothing was said in each condition about trying to do better. The second film was then shown, and was followed by a final test which consisted of the same 25 items on the first test plus 10 questions on the second film.

Findings:

1. On the items which tested how to read the slide rule, no significant differences were found among the incentive conditions.

2. On the 10 items on how to use the slide rule, there were significant differences between the incentive conditions, with reproof highest and no incentive lowest.

Conclusion:

The data provided no evidence that the incentive communication lead to any improvement in a skill which had already been partially mastered (reading the slide rule) but did have an effect on the mastery of the new skill (using the slide rule).

**KOPSTEIN, F., and ROSHALL, S. M.**, "Learning Foreign Vocabulary From Pictures vs. Words", Amer. Psychologist, (1954), 9:407-408.

Purpose:

Previous research had indicated that the learning of a list of paired associates is more rapid if pictures rather than words are used. This study was designed to determine if this superiority would occur if (a) the words in the response position were foreign rather than English, and (b) testing were done with equivalent English words in the stimulus position.

Subjects:

The subjects for the study were two groups of 428 and 360 basic airmen.

Procedure:

A selected list of eight nouns designating concrete objects was translated into Russian and the Cyrillic spelling approximated with an English alphabet. Each term was also represented in pictorial form so that each Russian term in the response position could be paired with either the pictorial form or the printed English form in the response position. Two parallel versions with nine repetitions of the list (intralist serial order randomized) and three test series interspersed were recorded on 16-mm. motion picture film. Test series showed only the stimulus portion of the pairs either pictorially or in printed form and the subjects recorded answers in written form. Two separate comparisons of the picture version with the word version were made. In the first picture trained subjects were tested with words. In both experiments the word-trained subjects were tested with words.

Results:

In the first of the two comparisons, the mean number of correct pair responses on each of the three test series was significantly greater (.01 level) for subjects trained with pictures. On the second comparison the pictures maintained their superiority on two of the three test series but to a lesser extent.

Conclusion:

The results suggest that foreign vocabulary may be acquired more rapidly if pictures are used as cues, but that the advantages of such a procedure may be affected by the method of testing or application.

LEVINE, S., "The Role of Motivation in the Effects of 'Active Review' on Learning from a Factual Film", Amer. Psychologist, (1953), 8:388-389.

Purpose:

Previous research has revealed that learning from films increases when the viewer participates in "active review". This study was designed to test the hypothesis that this effect is a result of specific effects of practice during the review period.

Subjects:

Four groups of basic airmen (939) served as subjects for the study.

Procedure:

Half of the classes were shown a film, on world maps, with active review. There was no review for the other half. Within these groups, half of the classes were run under high motivation and half under low motivation. The review sessions were interspersed during the film showing and 10 of the 35 test questions were practiced in these sessions. Over-all motivation was manipulated by instructions given prior to the film showing. The review sessions consisted of having the class write answers to the questions on a previous part of the film. The correct responses were provided the subjects after this practice.

Results:

1. Significant gains occurred on non-practiced items in the active review groups under low motivation conditions.
2. Considerably larger gains occurred on the practiced items than on the non-practiced items. This occurred under both high and low motivation.

Conclusion:

Under conditions of low motivation active review procedures can result in gains due in part to motivation.

MERCER, J., "The Relationship of Optical Effects and Film Literacy to Learning from Instructional Films", Pennsylvania State University Instructional Film Research Program, Port Washington, New York, U. S. Navy Training Devices Center, Office of Naval Research, Technical Report No. SDC 269-7-34, Nov. (1954).

Purpose:

To determine the relationship between learning from films and the use of optical effects (fades, wipes, and dissolves) and to study the relationship between "film literacy" and learning from films.

Procedure:

Three versions of two films were produced: (1) no optical effects, (2) optical effects between main sequences only, and (3) all optical effects contained in the original version of the film. The films were shown to groups of Navy and Air Force recruits under two conditions. In the first, the subjects listened to a lecture and viewed a film on optical effects before the film. After the film, the subjects were tested on film content.

Results:

1. There was no significant difference in the performance viewed in all three versions of the film.

2. The Air Force Subjects which heard the lecture on optic techniques did not learn significantly more than those who did not hear the lecture. The opposite was true for the Navy groups where the difference was significant at the .02 level.

Conclusions:

1. The presence of optical effects does not appear to aid learning from the film.

2. An illustrated lecture on optic techniques does not conclusively add to or detract from learning.

III-E-6

MILLER, J., LEVINE, S., and STERNBERG, J., "The Effects of Different Kinds of Review and of Sub-titling on Learning from a Training Film: A Replicative Study", Air Force Personnel and Training Research Center, Training Aids Research Laboratory, Unpublished Staff Research Memorandum (mimeo.), (1954), Symposium on Programmed Instruction, 1961, Publication 943, National Academy of Sciences--National Research Council, Washington, D. C., (1961), p. 521.

This experiment was an unsuccessful attempt to replicate a previous study by Miller and Levine (1952), in which massed review was found to be superior to spaced review, and also to control the variable of recency. The massed-review procedure was followed immediately by a post-test in the Miller-Levine study, while a greater time interval elapsed between most of the spaced review and the post-test. The experiment employed a 2 x 2 x 3 design, with two conditions, delay and no delay, for each combination of sub-titling (sub-titles versus no sub-titles) and review (spaced, massed, or no review). Subjects were 36 classes of Air Force basic trainees, instead of the high school students used previously. Three classes were assigned to each of the twelve cells. An additional control group of five classes was tested without being shown the film. The results showed significant effects of the film in comparing all experimental groups with no-film control group, but no significant differences were found for the variables of sub-titling (as before), nor for review conditions (unlike the previous study). The largest t-value for any comparison among experimental group means was about 1.2. However, little import can be attached to these negative results, particularly since the class means were highly variable and even the differences between immediate test and delayed test were small and non-significant (as were those between either form of review and no review at all). Thus, the conditions necessary for a satisfactory experimental test of the hypotheses were not obtained. The experimenters suggest that this situation may have been due, in turn, to (1) weak motivation (e.g., the trainees had been subjected to a battery of tests prior to the experiment) combined with excessive auditory and visual distractions which were present during testing, and (2) the rather uninteresting nature of the film which was used.

III-E-6

MILLER, J., and KLIER, S., "The Effect of Interpolated Quizzes on Learning Audio-Visual Material", Air Force Personnel Training and Research Center, Training Aids Research Laboratory, Unpublished Lab. Note (mimeo), TARL-LN-56-8, January 1956 (a), In-Student Response in Programmed Instruction--A Symposium in Experimental Studies of Cue and Response Factors in Group and Individual Learning from Instructional Media. Edited by Lumsdaine-Publication 943, National Academy of Sciences, National Research Council, Washington, D. C., 1961, pp. 517-8.

This study and the following one were conducted at Queens College under Contract Number AF 18 (600)-38. This study was primarily concerned with the effects of interpolated activity between successive showings of a training film and also compared single versus multiple presentations of the film. The rationale was that the increments due to repetition of the film could be increased by interpolating a quiz between each pair of showings, and that the gain should exceed that due merely to the concomitant increase in distribution of practice. Eight different flights of Air Force basic trainees were tested after each of the following five treatments: (1) "spaced quiz"--quizzes interpolated between each of the three showings of the same film ("Principles of Lubrication"); (2) "spaced"--an unrelated task interpolated between the three showings of the same film, in order to space the three presentations; (3) "massed"--the three showings of the same film with no intervals between them; (4) one showing of the film; and (5) no film. Subjects were assigned (also instructed and tested) in flight units, and thus a flight was properly considered to be the sampling unit in the statistical analysis. The criterion test consisted of 26 multiple-choice items on the film content, of which the first nine were identical to those used in the quizzes for the spaced-quiz group. Results on the first nine items showed that the spaced-quiz group was not significantly superior to the spaced group which had had no prior exposure to these items (although superior to the other groups); thus, practicing the items (without knowledge of results) did show reliable evidence of better learning. Results were also analyzed both for the total test (26 items) and for the 17 items not included in the quizzes. Data summarized here are for the total test.

Comparison of one-showing mean score (12.9) and the no-film mean (7.9) showed a highly reliable though not numerically large gain from seeing the film (t = 7.5, with 14 df). In the analysis, some attempt was made to reduce variability by matching up flights of similar distribution on ability-test (AFQT) scores; however, full use of the stratifying (AFQT) data was not made, and the complete data were no longer available when this summary was prepared. This might account in part for the lack of significant inter-treatment differences, using 14 df in each instance. The superiority of the condition with the highest obtained mean (spaced quiz; mean, 14.8) was of borderline significance (t = 2.5) as compared with the one-showing group (mean 12.9), while t in comparing the latter with the mean for the three-showing massed group (13.40 was only 0.6). The obtained mean of 14.5 for the spaced (no-quiz) group was nearly as high as for the spaced-quiz group; none of the three showing groups differed significantly from the others. Thus, though the ordering of the obtained means was consistent with expectation, the analysis was not successful in demonstrating the advantages postulated for the interpolated quizzes. (Cf. Kimple, 1955; and Romney, 1952).

MILLER, J., and KLIER, S., "The Effect on Active-Rehearsal Types of Review of Massed and Spaced-Review Techniques", Air Force Personnel Training and Research Center, Training Aids Research Laboratory, Unpublished Lab Note TARL-LN-56-6 (mimeo), January 1956 (b), Symposium on Programmed Instruction, 1961, Publication 943, National Academy of Sciences, National Research Council, Washington, D. C., (1961), 518-519.

This study was conducted as a follow-up to the studies by Miller and Levine (1952) and by Miller, Levine, and Sternberg (1956). These two studies, both using high school students as subjects but employing two different film topics, found "massed review" superior to "spaced review". (A replication of the first study with the same film shown on military subjects was, however, unsuccessful in replicating the Miller and Levine results: see summary of report by Miller, Levine, and Sternberg, 1954.) The present study was concerned with whether the superiority of massed overspaced review would apply to active review (in which students respond overtly to review questions instead of merely having the review presented to them) as well as to the "passive" types of review previously employed. It also made a direct comparison between the active and passive-review procedures, using the same test and same film, "Pattern for Survival", employed in the 1956 Miller, Levine, and Sternberg study (and also, earlier, by Michael and Maccoby: see Chapter 18). Subjects were high school students from 34 classes (sampled by class groups). One class from each of eight different high schools was assigned to each of three review conditions: (1) active massed, (2) active spaced, and (3) passive massed; and one class apiece from six of the schools to a control group which was tested without seeing the film.

Comparisons of immediate post-test scores showed highly significant differences (using t-tests) between each of the experimental groups (means of about 138) and the control group (mean of 40), indicating that substantial learning occurred from the film--43v832 combinations: but no significant differences were found among the three experimental review groups on immediate testing (t was less than .05 in each case). When the classes that were still available were re-tested for retention after a three-week period the means were 123 for active spaced, 117 for passive massed and 117 for active massed; the largest t, for the first two, was 1.4 (10 df). It may be noted that lack of an advantage for massed over spaced review with the active form of review could arise from the fact that, despite the use of KCR, potential benefits of spaced practice in the massed-review condition may be overbalanced (which is less well prompted because temporally more remote from the corresponding first presentation of each topic).

III-E-6

NELSON, H. E., and MOLL, K. R., "Comparison of the Audio and Visual Elements of Instructional Films" (Pennsylvania State University Instructional Film Research Program) Port Washington, New York: U. S. Navy Training Devices Center, Office of Naval Research, Technical Report No. SDC 269-7-18, (1950).

Purpose:

This report deals with two experiments in which the effectiveness of the auditory and visual elements in instructional films were compared in order to study their relative contributions to learning.

Procedure:

Two films dealing with aerodynamics (Theory of Flight and Problems of Flight) were used in one experiment; the other experiment used a film entitled Land and Life in the Desert, dealing with desert survival.

The aerodynamics films study used 430 ROTC trainees divided at random into eight groups. The desert survival study used 388 college students who were divided into 5 groups. In each study each group (except for a control group) was exposed to the film(s) under several experimental conditions which were: (1) only heard the film in the light, (2) only heard the film in the dark, (3) only saw the film, and (4) both saw and heard the film. Immediately after exposure to the films, the subjects were administered multiple choice tests on the contents of the films.

Results:

1. In every case the groups which had some film treatment were better than the control groups which did not see or hear any film.

2. The groups which both saw and heard the film were better than the groups which only saw or heard the film.

3. In both studies hearing the sound track in the dark was slightly more effective than hearing it in the light.

4. A least squares analysis was made to study the relative effectiveness of audio and video elements in the film. For the film, Theory of Flight, the audio factor was the most important, while for the other two films, the video factor was the most important.

Conclusions:

1. Significant learning accrued from the presentation of the films as a whole, and from the presentation of either the audio or video channel alone.

2. Neither channel was consistently better than the other. The relative effectiveness seems to depend upon the particular film and its content.

3. Both channels together were consistently better than either one alone.

4. A "both" factor was identified. Where this is a plus factor it indicates that some items are taught jointly by the audio and video working together; where it is a minus factor it indicates that some items are taught in both the audio and visual channels (i.e., there is some overlapping).

5. In general, hearing the sound track in the dark appears to be slightly superior to hearing it in the light.

III-E-6

NEU, D. M., "The Effect of Attention-Gaining Devices on Film-Mediated Learning", (Pennsylvania State College, Dept. of Educ., Instructional Film Research Program), Port Washington, N. Y.: U. S. Naval Training Devices Center, Office of Naval Research, Technical Report No. SDC 269-7-9, (1950).

Purpose:

The purpose of this study was to determine the relative effectiveness, in producing learning from films, of three levels of attention-gaining devices; (1) relevant devices, (2) no devices at all, and (3) irrelevant devices. Relevant devices include any emphasis technique that is related to or operates on a specific point to be emphasized on a film. Irrelevant devices are emphasis techinques that call attention to the screen but otherwise are unrelated to film content.

Subjects:

The subjects for the study were 1576 Army recruits and 1055 Navy recruits.

Procedure:

Five versions of a film on the use of machine shop measuring instruments were produced. These versions were: (1) a basic version with no attention-gaining devices, (2) a visual relevant version, (3) a visual irrelevant version, (4) a sound relevant version, and (5) a sound irrelevant version. Attention-gaining devices were placed at the same points in versions 2-5, and each version had 26 devices.

Companies of recruits were divided into 6 comparable groups. Five of these groups were each shown one of the experimental film versions. Immediately after the films, they took tests to measure learning of factual material and recall of attention-getting devices. The sixth (control) group took the information test without seeing the film.

Results:

1. There is no evidence that the insertion of relevant attention-gaining devices of the kind used in this study adds to the effectiveness of an informational film. There is some evidence that irrelevant devices detract from the effectiveness of the film.

2. No significant difference was found between the effectiveness (or ineffectiveness) of visual and sound attention-getting devices.

3. Ability to recognize and remember which devices were used in a film version was practically independent of learning from that version.

Conclusion:

This study leads to the general conclusion that attention-gaining devices of the kinds inserted in these films do not add significantly to learning.

III-E-6

ROSHAL, S. M., "Effects of Learner Representation in Film Mediated Perceptual-Motor Learning", Pennsylvania State University Instructional Research Program, Port Washington, N. Y., U. S. Navy Training Devices Center, Office of Naval Research, Technical Report No. 279-7-5, December, (1949).

Purpose:

This study was conducted to determine if training films become more effective as they approach absolute realism in presenting task or skill.

Subjects:

Subjects used were 3314 navy recruits.

Procedure:

Eight experimental versions of a film were developed to teach the tying of three different knots. The films included various combinations of four variables: (1) camera angle--from viewpoint of learner and at 180 angle; (2) motion--both with and without; (3) hands--shown with and without; and (4) participation--both with and without.

These films were systematically paired and presented to the recruits. Two control groups saw no films. All recruits were then tested on tying these three knots.

Results:

Camera angel giving the performer's eye-view with continuous motion proved most effective. Participation had no significant effect in this study.

Conclusions:

Films, approaching absolute realism in presenting a task are more beneficial than non-motion, stand off views of a task. Further research is needed in participation.

III-E-6

STEIN, J. J., "The Effect of a Pre-film Test on Learning from an Educational Sound Motion Picture", (Pennsylvania State University Instructional Film Research Program) Port Washington, New York: U. S. Navy Training Devices Center, Office of Naval Research, Technical Report No. SDC 269-7-35, (1952)..

Purpose:

The purpose of this study was to determine the effect of a pre-film test (administered before subjects viewed the film) on learning from an educational movie.

Procedure:

The subjects were 6034 Navy recruits. The subjects were divided into 17 groups, equated according to the Navy General Classification Test. The groups were administered the test under various conditions. These conditions or variables were: (1) knowledge of results, (2) type of question, and (3) order of questions.

Results and Conclusions:

A pre-film test, which has identical ordered items, with complete knowledge of results, immediately followed by a film, will result in more learning and retention than when a film alone is shown once or twice. Pre-film tests prove effective on all subjects regardless of intelligence. Learning of content not specifically covered by questions in the pre-film test is as great for those who take the test as for those who see the film but do not take the pre-film test.

**ZUKERMAN, J. V.**, "Commentary Variations: Level of Verbalization, Personal Reference, and Phase Relations in Instructional Films on Perceptual-Motor Tasks", Technical Report No. SDC 269-7-4, Pennsylvania State University Instructional Film Research Program, Port Washington, New York, U. S. Naval Training Devices Center, Office of Naval Research, August 1955.

### Purpose:

To determine the effects of three kinds of variations in the commentary of instructional films on knot tying tasks.

### Procedure:

One thousand seven hundred and eighty-seven navy recruits (in groups of 60) were shown specially produced instructional films (knot tying) in which the commentary was varied in three ways: (1) level of verbalization (variations in amount of detail); (2) personal reference (1st, 2nd, or 3rd person, or imparative); and (3) phase relationships (sound leading or following the picture). Comparisons were made using pairs of these groups. The measure of learning was the number of correctly tied knots in each group.

### Results:

1. Level of Verbalization - The most effective version was medium verbalization, with high and low verbalization next and no sound last.
2. Personal Reference - Second person and imparative were the most effective versions, with first person next and third person last.
3. Phase Relationships - Sound leading the picture was the most effective version.

### Conclusions:

1. Verbal descriptions in instructional films and learning but may be increased to the point that they hinder learning.
2. With a military population authoritarian commentary (2nd person and imparative) is the most effective in producing learning.
3. The phase relationship between auditory and visual elements in instructional films had an important bearing on the film. This relationship may be related to the difficulty of the task.

## Criterion Group Three Summary

Research reports classified in Criterion Group Three probably have more implications for media research than those in either Group One or Group Two. In general, the Group Three studies are based on relatively short-term learning experiences involving highly specific criteria used to evaluate performance. This same condition characterizes most media researches.

As in the first two groups of studies, the differential effect of nonintellective factors and sex and intelligence was readily apparent. It can also be noted that there is an interaction between the amount of anxiety shown by learners and the kind of material being learned.

Investigations involving "set" suggest that this is an important variable which has not been studied sufficiently. It seems reasonable to assume that set is a combination of anxiety and motivation to learn and hence an important contributing factor to learning outcomes. Additional study of this characteristic will require longitudinal research to trace the effect of differing sets on performance.

Nonlinear relationships - In reviewing the studies classified in Group Three, the lack of concern for nonlinear relationships between nonintellective factors and learning outcomes is apparent. With linear analyses, many nonsignificant results are reported which might otherwise have yielded significance had curvilinear analyses, where appropriate, been utilized. It is conceivable that curvilinear relationships may also account for some of the interaction reported earlier between intelligence and nonintellective factors.

Pretest sensitization - The typical group comparison design used in Criterion Group Three studies has been the classical two-group design.

This design assumes that there is no interaction between between pre-experimental measures and criterion changes. For example, if high anxiety is experimentally generated in one group through pre-experimental procedures and no such procedures are followed with the control group, it is assumed that criterion change is independent of the pre-experimental measurement. Thus, the possible effects of pretest sensitization are ignored. Likewise, units of measurement throughout the scale of pretest measures have also been assumed to be comparable - another questionable assumption. There is a need for experimentation using the well known Solomon design with at least four groups so as to assess more accurately the pretest sensitization phenomenon.

Lack of replication - Whereas most researches involving nonintellective factors in Groups One and Two involved no attempts at replication, some excellent examples of replication are found among the Group Three studies. As long as only one subject matter area, or one sample of subjects is involved in an experiment, generalization is limited. Future media investigators should recognize the shortcoming of many previous studies in the nonintellective area and avoid this basic inadequacy.

## General Summary and Implications

The research reports reviewed in this project have many implications for future media research involving nonintellective factors. Among these implications, those discussed in the following paragraphs are considered to be of greatest importance.

Relationship of nonintellective factors to achievement - Of the vast array of nonintellective variables that have been correlated with learning outcomes, there can be little doubt but that many bear a significant relationship to achievement. The number of conclusions that can be drawn, however, is small compared to the total effort which has been expended on this area of research.

Illustrative of the variety of nonintellective factors which have been studied in relation to achievement is the following (but by no means exhaustive) list of author-generated labels: persistence, self-disclosure, need achievement, health, interest, values, motivation, socio-economic level, nativity of parents, leadership ability, school size, study methods, parental attitudes, PTA membership of parents, school library conditions, professional aspirations, parental pressures, conformity, behavior observations, anxiety, character traits, sense of accuracy, community variables, teacher warmth, teacher permissiveness, sociometric ratings, grade utility, level of aspiration, maturity, seriousness, self-confidence, concern for others, introversion, physiological processes, biographical inventory items, manifest anxiety, restraint, thoughtfulness, beliefs, flexibility, rigidity, personal history data, skeletal maturity, life career motivation, age of entrance to school, goals, degree of application, attitude toward education, work schedule, work experience, satisfaction with vocational choice, depression, size of high school, bilingualism, only child status, consistency of performance, affiliation, maturation rate, influence of familiar background music, positive and negative results, praise, reproof, personal preference for method, audio-visual elements, learner representation, intellectual curiosity, behavior control, overt symptoms of emotional tension and heterosexuality. Listing the illustrative factors in random order emphasizes the need which exists for an orderly and systematic approach to conducting research on this topic. A well-constructed taxonomy available to researchers prior to the conduct of the studies could have made a substantial contribution to research efficiency in the area.

Justification for studying nonintellective factors appears to be of two types, (1) possible elimination of interfering influences arising from nonintellective factors and (2) the importance of nonintellective factors in decisions to either continue or discontinue an educational experience. There is substantial research evidence to support both of these frames of reference.

Relative effectiveness of various predictors - From the vast arrays of nonintellective factors studied, it is difficult to pinpoint the single category which has the highest relationship to achievement. The relative effectiveness among the nonintellective predictors seems to arise from methodological rather than from content considerations. Those measures which are criterion specific far excell those which are criterion general in accounting for variation in learning outcomes. In terms of media research, this suggests the need for assessments of reaction to specific experiences rather than the use of broadly-constructed devices. It is unrealistic to assume that generalized attitude scales, values inventories, interest inventories or personality measures designed for molecular assessments of the individual will account for large amounts of outcome from specific learning experiences.

Ultimate application of findings of research - A large number of research studies designed to identify important nonintellective characteristics of learners has been conducted. Certainly identification and description are important processes as initial stages of research, but little is gained if the quest for knowledge is carried no farther than these initial stages. Careful analysis of some of the nonintellective characteristics suggests that some (such as basic personality characteristics and behavioral preferences) are not subject to modification, whereas others (such as attitudes and mental "set") are very likely to be modifiable. Once important modifiable characteristics of learners have been identified, extensive research efforts should be initiated to determine the conditions under which modification can take place. Conversely, when important unmodifiable characteristics have been identified, such other factors as selection practices, organization of material to be learned, and learning conditions should be explored. There is a paucity of research effort which has been directed toward extending results from identification and correlation studies to actual experimental or causal levels. More research which is experimental in nature, rather than associative, is badly needed.

Interaction with ability level and sex - It is apparent from examination of the literature that the relationship of many nonintellective factors to learning outcomes varies with ability levels and sex. This suggests that significant relationships may have been masked in many studies in which possible interaction was not recognized. Although the noted interaction may be the result of heredity, it seems more likely to be the result of differential experiences for the sexes and ability levels of subjects. Regardless of the reason for the interaction, it is appropriate for this circumstance to be recognized in designing subsequent research in the nonintellective area.

Changes in nonintellective factors over time - The majority of researches involving nonintellective factors in learning have been cross sectional in nature, i.e., they have involved one measure of the factor. Sometimes the factor has been measured prior to the learning experience, other times it has been measured during the experience and at still other times it has been measured after the experience. Relatively few studies have been made in which several measures have been undertaken at all three points in time. It is reasonable to assume that many nonintellective factors, such as attitudes, will show substantial changes during a learning experience and that these changes will affect the role of the factor in the learning outcomes. Studies involving repeated measures of nonintellective factors are sorely needed.

Reliability of the criterion - There has been great variation among investigators in the attention which criterion reliability has received. Many investigators have deplored the lack of suitable methodology to assess the reliability of accumulative grade point averages. Others have attempted to estimate this characteristic and still others have ignored it completely. If meaningful interpretations of results of explaining variation in learning outcomes are to be made, some assessment of criterion reliability must be made. In subsequent investigations involving new educational media, it is suggested that criteria other than accumulative averages be utilized in the research. The importance of such averages for student personnel decisions cannot be denied, but more homogeneous criteria will make the results from media research much more meaningful.

Types of research design - Although it is not possible to specify the appropriate design for any given study until its purpose has been defined, it is likely that future media research will move away from the correlational analyses upon which the majority of investigations in the nonintellective area have relied. This likelihood is based upon the trend of media research toward causation rather than association. Consequently, more group comparisons can be expected. Whereas the usual approach to experimental studies has been that of exposing comparable groups to different experimental conditions, a variation of this approach offers considerable flexibility in media research. This modified approach is that of exposing groups comparable in all respects but one to a single experimental treatment. Obviously, such an approach requires large numbers of subjects, but has considerable potential for media research.

Summary statement - The importance of nonintellective factors in learning had been repeatedly demonstrated. The number of conclusions which can be drawn in this area, however, is proportionally more limited than the amount of research effort expended. Major implications of the research literature for subsequent studies involving new educational media including such considerations as criterion specificity, interaction of nonintellective factors with ability levels and sex, repetition of measures during learning, and criterion reliability.

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